MARCH, 1943

Industrial FINISHING

Published Monthly in the Interest of Modern Production Finishing

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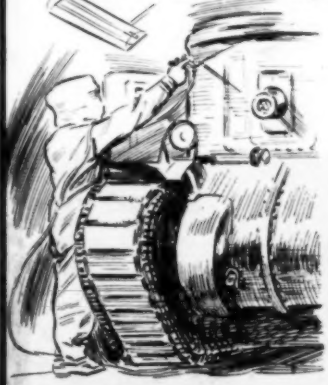
It's a Good Idea!

★

—ANOTHER GOOD IDEA...



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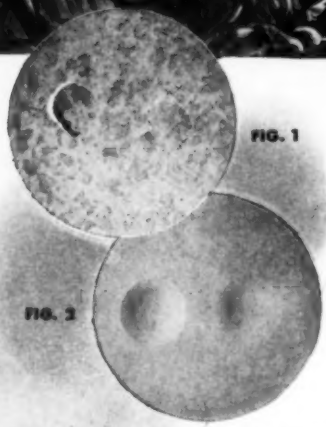

FIG. 1

FIG. 2

BURIED IN MILDEW INFESTED EARTH FOR 30 DAYS

Fabrics finished with conventional 7 to 12 coat dope systems lose approximately 60% of their original strength following attack by mildew organisms. (Fig. #1). Fabrics finished with the 4 coat EMYCEL system and subjected to identical conditions of exposure to mildew retain 95% of their original strength. (Fig. #2). Bursting strength recorded on Mullen Tester.

LIGHT PLANES, eyes of the Army, take cove with the troops among trees and underbrush where fabric rotting due to mildew is unbelie ably sudden and severe, especially in the tropic

When Roxalin's fabric finish, EMYCEL, was fir developed, it was specifically engineered to with stand mildew attack. Service records of Emyc finished planes prove its capacity to stand up i active use, under all climatic conditions.

Other reasons why EMYCEL is setting ne standards for aircraft fabric finishing are suc production advantages as the need for fewer coat and freedom from blushing in weather whe doping with conventional materials is impossibl

The invention of EMYCEL is an example Roxalin's original approach to finishing problem peculiar to the aircraft industry. Write us fo further data on EMYCEL.

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POWERFUL YET VIBRATIONLESS!

The NEW "Sterling-1000" Electric Sander packs the kind of power punch you want! All the strength you need for continuous high speed production, yet *controlled* to obtain absolute *vibrationless* operation. The "Sterling-1000" is stout enough to tackle the toughest job—streamlined and balanced for easier handling. An engineering triumph. Won't shake itself into breakdowns—or jingle-jangle the operator's nerves! Women operators prefer operating this new sander!

NEW SANDING ACTION CUTS FASTER—SMOOTHER! Orbital, circular, thousands of abrasive grains cut furrows which cross and recross each other. With this action, the "Sterling-1000" *cuts faster*—produces the smoothest surface you've ever known on wood, metal, plastic or composition. Ideal for many rubbing and polishing operations.

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..WHAT'S THE BIG IDEA?

It's a vital industrial force that creates new ideas—BIG ideas—that mean important, new things for all of us. It's a *force,* if you please, but a down-to-earth *working* force—no mere abstraction of the philosopher's mind.

SYNERGISM isn't a new word—it goes back to the classic Greek and has been known to the scholar, the theologian, the doctor and chemist. Basically it means "forces working together to produce a whole greater than the sum of the parts."

War production has given SYNERGISM a new, vital meaning. For the miracles in shop, laboratory, on the rails, in the air, are possible because of the stimulation of mind by mind, so that end-results are greater than the sum total of individual ideas.

As individuals can be stimulated to greater "mind-output" through synergism, so can departments or companies. Across the table ideas "click", and new applications, new methods, new products are created. The separate thoughts have merged—greater new ideas are born; **2 plus 2 now equal 5.** This we call synergism. At Zapon we are synergism-minded. In our fields we hope to join our skill with yours for new creations beyond expectations.

ZAPON

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INDUSTRIAL FINISHES

NINETEENTH YEAR OF PUBLICATION

Industrial FINISHING

Reg. U. S. Pat. Office

Published Monthly in the Interest of Modern Production Finishing

Vol. XIX, No. 5 **MARCH, 1943** **$2.00 a Year**

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Letters from Readers . . .

Permanent Black Finish for Steel

We notice, in the October issue of INDUSTRIAL FINISHING, page 15, an article dealing with permanent black finish on steel, and the process rather interests us. We shall be glad to know if you can give us the composition of the chemical salt used.—R. C. Ltd., West Bromwich, England.

We do not supply formulas for making protective coatings.—ED.

Bake Finishing

Will you kindly advise me how I may obtain INDUSTRIAL FINISHING? I am particularly interested in the articles which pertain to metal spraying and the baking of finishes in convection-type ovens, or through the use of the recently developed infra-red method.—S. S. D. (Supervisor).

Information supplied.—ED.

Porcelain Enamel Signs

I wish to get information regarding the manufacture of porcelain signs. Can you give me the names of companies dealing in equipment and material necessary to produce these signs?—A. R. H.

Try Ferro Enamel Corp., Cleveland, Ohio.—ED.

Spray Gun Chart

In the January issue of INDUSTRIAL FINISHING you published an article by Mr. F. Hagan entitled, "Care of Spray Guns." We are interested in

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for WOOD and METAL

Olive Drabs ★ **Rot Inhibiting Primers**
Lustreless Enamels **Battleship Grays**
Shell Lacquers ★ **Airplane Dopes**

If you are figuring on Government contracts with the Army, Navy, Air Corps or any branch of service—we are equipped to furnish the finishes according to Government specifications. Our staff of Laboratory Technicians is familiar with all problems and its services are available for the asking.

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DU-BAR BLEACH ★ **FABRI-CLEAN**
For modern light-tones **The magic Fabric Cleaner**

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Mfrs. of "Unquestionable Quality" Industrial Finishes
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PERFECTION
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without rubbing
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are made by chemical treatment of Gums—not with stearates. They produce a clear finish • will dull rub or polish • no haze after rubbing • will air dry or force dry • no printing • waterproof • liquor-proof • durable and economical. Full range of sheens.

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SPECIFICATION PROTECTIVE COATINGS

UNITED'S Specification Protective Coatings are doing their part to help keep war production schedules rolling.

There is a specially formulated United product to meet the rigid requirements of any Government specification protective coating. Years of constant research and product development have enabled us to meet the unusual requirements and demands of war work.

Call on United for Government Specification Coatings and let us help you solve your finishing production problems and "Keep 'Em Rolling."

UNITED'S S. P. COATINGS ARE NOW USED ON SHELLS, AMMUNITION BOXES, AMMUNITION, ARMY TRUCKS, SIGNAL CORPS EQUIPMENT, INSTRUMENTS AND PANELS, AIRPLANE PARTS, PORTABLE MACHINE SHOPS, ETC.

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WHAT ABOUT 1943?

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CLAREMONT WASTE MFG. COMPANY

CLAREMONT, N. H.

The country's largest mfrs. of Cotton, Wool and Rayon Flocks

this and would certainly appreciate your telling us how we can contact Mr. Hagan to secure a copy of the chart he mentioned in his article.—Y. Drum Co.

We are sending you the name and address of the spray equipment manufacturer whose charts Mr. Hagan refers to.—ED.

Putty for Sheet Metal Finishing

I am writing to ascertain if you can give me some information on the following subject.

The manufacturers of metal doors and partitions have a certain kind of putty or surfacing compound which they use for filling joints and defects in the metal before the baking primer is applied.

The material I refer to I have never seen used, although I have an idea as to what it looks like. The information I have was obtained by cutting through the baked enamel finish on a metal door. Right next to the metal I found a very hard putty-like substance that had the appearance of plastic wood.

I have been informed that when metal doors are ready for painting the entire surface is given a surfacing coat of this and, when dry, the surface is sanded and then primed nad finished.

Any information you can give me regarding this type of material and the manufacturer will be appreciated.—L. H. W.

A short article about this was published on page 52 of April 1942 issue of INDUSTRIAL FINISHING Magazine. A tear sheet of this page is being sent to you. The man who wrote the article is with a large metal casket manufacturing plant, and the material he had in mind is a product of one of our advertisers. The name and address of this company, as well as others who may have a similar product, are being sent you by letter.—ED.

Can Furnish Glass or Plastic Discs

In the Questions and Answers department of Feb. 1943 issue of this magazine (page 92) we notice that one of your readers requires 16-in. diameter discs, ¼-in. thick with a bevel edge and ½-in. hole through the center.

We are in position to manufacture ordinary glass, Lucite, Plexiglas, Vinylite, Cellulose Acetate and a new non-electro-static phenol-formaldehyde plastic which is particularly required for delicate instruments in which the

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PLUS!
Adaptation of formulae to the individual requirements of busy war contractors.
Within specification limits there are many possibilities of improvement in speed, workability, and freedom from rejects.
This PLUS factor is worth considering. We'd like to tell you more about it.
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CLEVELAND, OHIO

for WAR WORK

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PHOTOGRAPHIC
SILK SCREEN PLATES

★ Radio Dials, Airplane Dials, Instrument Panels, Bombs, Boxes, Cases, and many other uses.

Today NAZ-DAR Silk Screen Plates are playing an important part in the war effort. They are used to produce lettering, sharp detail and design on any type of surface. We maintain a service for the trade and can supply you with any type of Silk Screen Plate.

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Your Dollar Helps
Make Possible the

AMERICAN
RED CROSS

Double
Your Pledge!

electro-static charge in both glass and normal plastics causes a variation in the reading.

Of course, we require a priority, as we are not in position to handle anything but Victory work and are probably the only concern that is in a position to quote on all of the above items.—The Valley Mfg. Co., Waterbury, Conn.

"Dura Seal" Found

In the January issue of your magazine, on page 7, we observe that the H. Fixture and Supply Co. desires to locate the manufacturer of "Dura Seal." We are happy to inform you, in the event that you do not have this information in your files, that th's material is made by the International Chemical Co., 3140 S. Canal St., Chicago. We have used it on maple and it makes an excellent mar-proof finish.—E. W. A. Rowles Co.

Bottle-Cap Finish

We are interested in finishing used bottle caps. Removing the tin from the caps before applying the black chemical finishes seems to be a problem. Could you furnish any information along these lines?

Would appreciate a copy of your October issue, which carries an article on Black Finishes, by F. A. Westbrook.—S. B. Brewing Co.

Cleaning Fluid

We are in need of a cleaning fluid to be used in our sheet metal and welding departments, to remove oil and grease from steel tubular structures and aluminum parts. The cleaning must be between drilling, forming, welding, etc., operations, therefore should be done in those departments. The material must be fire-resistant and the process should be a simple rinse method.

We have a chemical cleaner and degreasing equipment in our plant but it is so located that it is very inconvenient for our production set-up.

We are also looking for a material to fireproof light canvas.—E. E. Corp.

Plumbing Fixture Coating

We are interested in a protective coating for use on die-cast plumbing fixtures. With the use of nickel and chrome curtailed, we are endeavoring to find something that would give us a durable finish—one that will withstand

(Continued on page 97)

★

Lacquers

Fillers

Stains

Enamels

Paints

First Line of Defense

—against the elements and enemies—camouflage in war and beauty in civilian applications—but, in both, PROTECTION FOREMOST. Protection—the most important function of any Lacquer or Paint—is also the greatest intangible variable. Will the product give real protection or not? The answer lies in the experience, knowledge and skill of the manufacturer. Technical knowledge has made Stille-Young Lacquers, Paints and Finishes the Specification material in many war operations and the standard to industrial users.

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China Wood Oil banned for making

*

"Confirming our conversation of even date, please be advised that China Wood Oil (tung oil) or Oiticica Oil have not been allocated for wrinkle finishes since December, 1942. It is not anticipated that these oils will be made available for such finishes in the near future."

* *From a letter received from Industrial Oils Division, Fats and Oils Branch of the U. S. Department of Agriculture, Food Distribution Administration.*

Oi(tung oil) and Oiticica Oil

ngWRINKLE FINISHES

(at the moment, an exception—Aircraft and Signal Corps Communications)

. . . but here's

"RINKOLIN"

a new wrinkle finish

made from LINSEED OIL

AMERICAN INGENUITY WILL NOT BE DENIED.

With the use of critical oils prohibited, Standard Varnish Works' laboratories announce RINKOLIN —a wrinkle finish made from *linseed oil* (free from china wood, oiticica and castor oils).

RINKOLIN is identical and comparable in every respect to regular wrinkle in both production use and appearance. Write, phone or wire for details.

Order five gallons of RINKOLIN *for your own production test*

SINCE 1870

STANDARD VARNISH WORKS

2600 Federal Street, Chicago, Ill.

2600 Richmond Terrace, Staten Island, New York

Applying masks (stamped from pressure adhesive paper) to Wright Cyclone cylinder assemblies. Tapered wooden plugs are used to seal the tapped holes.

Aviation Engine Finishing

BY M. FIORENZA
Wright Aeronautical Corp.

THE adoption of quantity production methods to meet the ever-growing demands for engines for the armed forces of America and her allies has necessitated the development of standard procedures for cleaning and painting the cyclone and whirlwind engines produced by the Wright Aeronautical Corp. In general, parts to be painted are divided into three main groups according to the service requirements and the temperatures to be encountered. These in turn govern the specifications of paint used for the different parts.

The first group comprises the major crankcase sections and miscellaneous aluminum and magnesium parts such as pump bodies, oil sumps, adapters, housing and covers. These parts are not required to withstand temperatures

in excess of 350° F. The first step in handling these parts consists of pre-cleaning their surfaces to remove heavy oil, chips, ordinary dust and dirt and any special compounds such as litharge or white lead, which may have been used. This operation is usually performed in a standard conveyor-type washer, using either plain hot water or an emulsifiable solution.

In the case of magnesium alloy parts, this pre-cleaning is followed by a second cleaning and rinsing in which the parts are dipped in a solution of a commercial alkali cleaner at a temperature of 185° F., and held for from two to five minutes. The concentration used is approximately 8 to 10-oz. of cleaner per gallon. After immersion the parts are given a warm water rinse to remove all traces of alkali. This treatment serves to remove oil, polishing rouge and other foreign substances from the castings, while at the same time making possible a much more uniform dichromate treatment with consequent improved protection and superior paint adhesion. The solvent degreasing operation, formerly used in place of this second cleaning, has been discontinued as being less effective and more expensive.

A protective treatment now follows. In the case of magnesium, the Dow Chemical Treatment No. 7 is used, while for aluminum, chromic acid anodizing is employed. Details of these treatments are given in my article entitled "Aviation Engines and Their Protective Coatings," which appeared in the May, 1942, issue of INDUSTRIAL FINISHING.

Pre-Cut Cardboard Masks

Prior to the actual application of the paint it is necessary to apply masks to certain surfaces to keep them free of paint. Pre-cut cardboard masks are now being used, since they have been found much more practical than the sheet metal masks formerly employed. Not only are the cardboard masks less expensive in first cost, but they serve to replace the steel which is so urgently needed for other purposes. They may be used repeatedly until they become too heavily coated with paint. Then they can be discarded, thus saving the time and expense formerly required for cleaning.

These cardboard masks also replace the adhesive masking tape formerly used in many locations. They have this advantage: They can be left in place throughout the baking operations, instead of

In this view you see a worker applying a prefabricated cardboard mask to a supercharger section. Notice the locating plug in the center of the mask for accurate positioning of mask.

being removed before the parts enter the oven, and then being replaced again before each subsequent coat of paint. Cardboard masks can be applied in from one fourth to one half of the time necessary for putting on tape, and they leave no gummy residue to be wiped off with solvent. Furthermore, the outlines are clear and sharp, as contrasted with the somewhat ragged outlines left by some taping jobs.

Small holes, whether plain or tapped, are closed with tapered plugs made from very soft wood. It has been found advisable to pre-heat these wooden plugs before use, to allow for shrinkage. They are screwed in and out of place, and checked for tightness after each baking.

Zinc Chromate Primer—Plus Synthetic Enamel

For the priming coat, zinc chromate primer is used. In using this material we have found it advisable to follow closely the directions given by the manufacturer for its application. A thin, wet, translucent coat gives the best corrosion resistance. A heavy hiding coat adds nothing to the protective value, but, on the contrary, actually offers less protection, in addition to seriously complicating the drying problem. The baking temperature is 250° F.

Synthetic resin enamels of the glyceral phthalate type are employed for final coats. These are prepared in strict accordance with Army and Navy specifications. Colors are either blue-gray or black. For aluminum alloy parts two finishing coats give adequate protection, but three are required on magnesium alloy parts on account of the susceptability of this material to corrosion. Each coat is baked at 250° F.

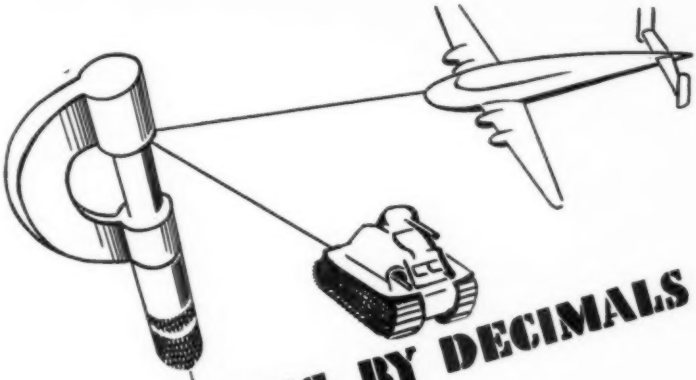
The second major group of parts consists of cylinder assemblies. They may operate up to, but not in excess of 500° F. The cylinder head is made of aluminum alloy, while the barrel, which is shrunk into place, is of steel. There is an increasing tendency at the present time to make use of metallizing as a protective medium on these parts, spraying them with pure molten aluminum. Nevertheless, many cylinders are still coated with paint.

In preparation for painting, the cylinders are placed on hooks on a chain conveyor and passed through a combination vapor and spray degreaser. This removes oil from the surfaces. The parts then pass through a Bonderizing solution to prevent the formation of rust, and at the same time etch the surfaces slightly to improve paint adhesion. After five minutes in this bath the parts continue on the conveyor to a warm water spray rinse. This is followed by a two-minute dip in a neutralizing bath consisting of a 1% solution of chromic acid. Passage through a gas-fired oven dries the parts thoroughly, after which they are cooled and removed from the conveyor.

Pre-Cut Adhesive Masks

A special combination steel mask and handling hook is applied to the lower flange of the part, and wooden plugs are inserted to seal the numerous holes. Pre-cut adhesive paper masks are used on the larger surfaces to be protected, since a close fit must be provided to prevent seepage when the parts are dipped in the paint bath; furthermore, the shape of these surfaces is such that cardboard masks cannot be easily attached.

The parts are suspended from conveyor hooks, and carried into position over the paint baths. They are then removed from the hooks,



DECIMATING BY DECIMALS

We like to think that our painstaking thoroughness and scientific perfection in the relentless pursuit of the proper protective coating for your product is as effective a weapon on the production front as armament is on the war front. In your battle for precision and accuracy, why not enlist our technical aid? Stringent controls assure constant uniformity on finishing material shipments. However, we don't stop at the scientific approach. We can be practical, too, by adjusting any of these special finishes to suit your shop conditions. If you would like to talk it over with us, drop a line to our Research Department.

★★★★

- Metal primers for tanks, blitz cans, bombs, gun mounts, etc.
- Lusterless Enamel Finish Coats for use over metal primer.
- Camouflage paints or compounds for metals and textiles.
- Coatings for roll coat application on land mines, gas mask canisters, hand grenades, etc.
- Interior coatings and sanitary lacquers for food and beverage containers.

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PROTECTIVE COATINGS

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dipped by hand into the paint, and placed on a drainboard for one minute. This permits the bulk of the excess paint to drain off, while that which remains, sets up slightly. At the end of the drain period the parts are replaced on the conveyor and passed through power-driven rollers which engage a roller on the suspension hook. This causes the parts to spin rapidly, throwing off the remainder of the excess paint and preventing the formation of beads. The adhesive masks are then removed, and the parts pass into the oven where they are baked at 350° F.

Leaving the oven, the parts pass through a cooling tunnel, and are then re-masked in readiness for the application of the second dip coat, which is similarly applied and baked. For certain engines a third coat may be applied, depending on the specification of the particular engine.

Sheet metal and similar parts, which make up the third main group, are handled in exactly the same manner as the crankcase parts; namely, pre-cleaning, anodizing, priming, and two coats of baked enamel. The only difference lies in the fact that a black enamel is used in place of the blue-gray.

Handling and Storing Synthetic-Base Enamels

The handling and storage of synthetic-base enamels require care and experience. It is well to make arrangements with the vendor to date each container so you can arrange to use all old stock first. The material should be stored in a room of moderate temperature, say between 60° and 65° F. If stored at higher temperatures, and especially if placed too close to radiators or steam pipes there may be defloculation of the pigment and partial polymerization of the vehicle. Paint should be allowed to remain in the paint room for a sufficient length of time to permit it to reach room temperature before it is mixed for use. Otherwise, if thinned cold, the final viscosity will be much too low when the mixture attains room temperature.

Regardless of the enormous increase in production, it is of the utmost importance that there be no let-down in the quality standards established. The conditions under which airplane engines must operate on war service are so much more severe than could ever be experienced in time of peace, that it is more than ever important that the utmost advantage be taken of every scrap of protection offered by surface finishes.

"Industrial Equipment Corp." Is New Name of I. S. M. W.

Industrial Sheet Metal Works, Detroit, Mich., announces that it has changed its name to Industrial Equipment Corp.

Established in 1929, the company today occupies an important position among manufacturers of dust-collecting and spray-booth equipment, as well as ovens and ventilating systems. One of the company's outstanding developments is the Hydro-Whirl Dust Collector for which it holds patents. The spray booths produced by the company also are equipped with the Hydro-Whirl.

The company continues to operate under the same management at the same address, 628 E. Forest Ave.

Collard Joins Black-Magic

The Mitchell-Bradford Chemical Co. (Black-Magic process of blackening iron and steel) Bridgeport, Conn., announces that Mr. H. Tom Collard of Protective Coatings, Inc., Detroit, Mich., has contracted to represent them in the state of Michigan, the far West and in certain other localities. Tom Collard has successfully promoted "The Tocol Line" and is an outstanding authority on applications for protective coatings.

Sure, they're in a hurry to get the job done!

Some of the many war products finished with Murphy Protective Coatings

Airplanes
Commando Ramps
Communication Sets
Gas Masks
Gliders
Optical Apparatus
Plywood Assemblies
Range-finders
Ration Cans
Searchlights
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Ship Fittings
X-Ray Equipment
Shells
Trucks
Machine Tools
Dental Equipment
First Aid Boxes
Propellers
Gunstocks
Sterilizers
Health Lamps
Navy Lockers
Sound Detectors
Ammunition

Time saved on the Production Front means a lot to them

The *right* finish means not only better protection for your war products, but time saved in production.

We know this is so, because we have served leading industrial users for over 75 years. And our protective coatings are now going on an impressively large number of war essentials.

From among the many formulas we have produced, we are sure we can supply you with a finish that will meet your particular needs perfectly. That means no time out for experimenting—no refinishing problems.

Note the list of products at left. You'll probably find one that's comparable to yours as regards finishing. And remember, we are always glad to create a finish to meet a special need. We've been doing it for years.

To those engaged in normal civilian production, we now offer Victory Finishes which require no priorities.

Get in touch with our nearest office

MURPHY VARNISH COMPANY
NEWARK SAN FRANCISCO CHICAGO

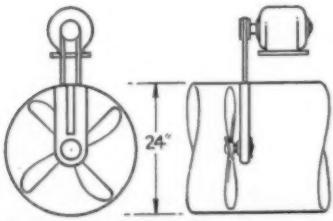
MURPHY Protective Coatings

Paint Spray Booths and Their Exhausts

BY GEORGE MONTGOMERY

WHAT IS A spray booth? The answer, I would say, is "a tunnel through which high-velocity air is drawn to remove paint spray mist from one or more spray guns." Spray booths are of two types, each getting its name from the arrangement of equipment used to create the suction and exhaust. In other words you have your choice of "direct exhaust" and "indirect exhaust" spray booths.

In the direct exhaust booth you have the fan right in the stack getting its air through the spray booth and exhausting it through a duct to the outside. Because of the fact that a paint spray-booth exhaust duct is classified by the Underwriters as a hazardous duct, the electric motor should never be placed in the duct, particularly any single-phase motor with brushes. The set-up should be so arranged that the motor is outside the duct and driven by a belt, with the belt or belts in a housing—or by a shaft extending through an elbow in the exhaust pipe.



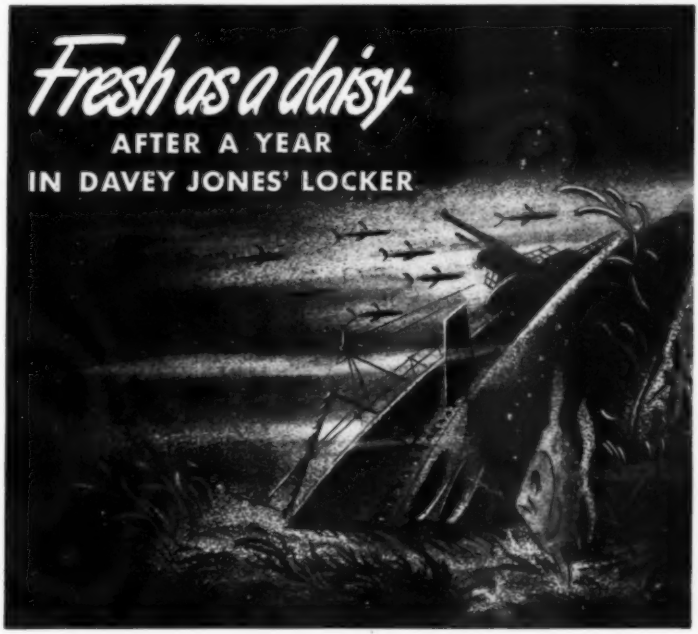
The motor that drives exhaust fan should be mounted outside of the exhaust pipe.

The fan itself should be "Underwriters' approved," for use in a hazardous stack. Fan blades should be made of a non-ferrous metal (brass, copper, aluminum) or wood or plastic, to make sure that it will not spark if it strikes or is struck by some foreign particle.

Indirect and Direct Exhaust Systems

In the indirect exhaust system a blower is operated to blow air up the stack through a Venturi tube, which acts as a syphon. The syphoned air comes through the booth. In this system the blower does not contact the air from the spray booth but pulls its air from the room in which the blower is located. No paint-laden air ever enters the blower to collect on the rotor fins or blades. Blowers should never be installed in the duct of a direct spray-booth exhaust.

The direct exhaust is used most extensively. The indirect exhaust



SHE was trim and taut as any sub can be when a tragic accident carried her to the Atlantic's cold, corrosive bottom. Not until a year later was she once again floating in the sun. Of all the tarnished, pitted, multitude of apparatus and devices she contained, two instruments on her control panel came up with their finish unmarred and unharmed.

That finish was a product of the Arco Research Laboratories — one example among many of Arco's ability to meet specific needs with specialized products, tailored to fit the most rigorous conditions. Arco is ready to help you find the solution to any problem paint can solve. Your inquiry will receive prompt attention.

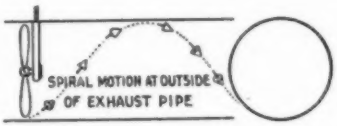
War Paints for Industry **THE ARCO COMPANY**
CLEVELAND, OHIO · LOS ANGELES, CALIFORNIA

will not operate well if there is any resistance in obtaining air in the room wherein the blower is located. Also, if the blower is in the same room as the booth, the air taken from the room is "over-doubled" because the blower air about equals the exhaust booth air.

Distributor Plates

At the back of the modern spray booth—that is inside the booth and in front of the exhaust pipe—you always find steel plates arranged in various ways. These plates (sometimes called baffles or distributor plates) are installed for a definite purpose and should not be removed. State laws specify a definite minimum exhaust rate over the area at the face of the booth (ranging from 100 to 175-ft. per minute). The distributor plates are arranged to prevent wide variations in air movements at different places around the face of the booth. For instance, a fan at the back of the booth, with no distributing plates, will suck air principally through the center of the booth. Very little air suction will prevail at the sides, top and bottom.

Correctly designed and properly placed distributor plates will correct this fault. Also, the plates help to keep the paint particles in the air moving to the rear of the booth in moderately fast-moving air until it gets behind the plates where the air is traveling three to four times faster. This increased velocity will raise the paint particles up to the fan. From here they enter into the stack where the air velocity again increases to three or four times faster (from 1,000 to 3,000-ft. per minute) which is sufficient to carry the paint particles up four or five stories and out to the open air beyond the stack where the air is quiet—and



Exhaust air from fan takes a spiral motion through exhaust duct as it leaves the fan. If it is loaded with spray mist, the residue is deposited upon the sides of the duct.

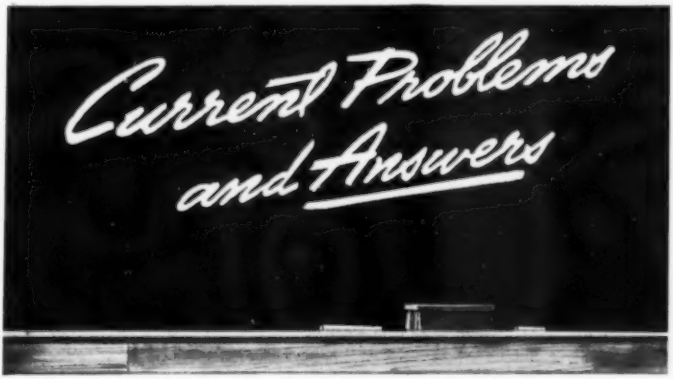
the paint particles fall on the roof and perhaps on cars parked nearby. The air velocity through the face of a paint spray booth is regulated by special laws in several of the states.

Water-Wash Booths

Now let's consider water booths. These booths are the same as the direct-exhaust type except that, between the back of the booth and the fan, a compartment is added to eliminate the paint particles so they never reach the fan or exhaust stack. In reality it is a special washing machine.

The equipment includes a water tank and pump, some means of making a water spray as the water passes through a restricted area at a given velocity, an expansion chamber, and a series of baffles or "packs," such as are used in large air-conditioning systems to remove water from the air.

The water is prepared with a compound and is used over and over again. The compound is added to "kill" the paint particles and cause them to float to the top of the water in the tank. Also, this preparation helps to prevent the paint from sticking to everything on the inside of the compartment and on the baffles or packs. However, the paint will collect and build up on the inside, therefore it must be cleaned occasionally. The frequency of cleaning depends upon



Problem No. 4 — Do You Need to Stock umpty Different Kinds of O. D. Finish?

As every finisher of war materials knows, Government specifications for the same olive-drab color differ in at least a dozen ways as to light reflectance, infra-red reflectance, weathering qualities, etc. The Army and Navy each has a different set of specifications for different classes of purchases. Is it necessary to buy a different finish to meet each one of these different sets of specifications?

The Answer is NO!

SIMPLIFICATION is the order of the day, so we have reduced the number of formulas required to ONE! We have ONE formula that will meet EVERY set of specifications issued by both branches of the service for olive-drab finish. Our formula can be used on any Army or Navy order with complete assurance that it will pass official inspections. Write for samples.

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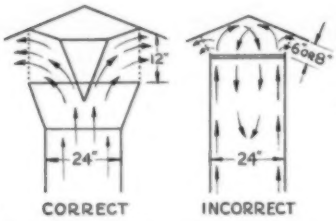


Top of exhaust stack deserves special attention. Sometimes the weather cap is too close to the top edge of the stack, as shown at right. A more satisfactory design is shown at left.

how many gallons of paint have been sprayed through the booth, and how well the water has been regularly prepared.

A booth that keeps itself clean by its own washing action helps, but a compartment with no removable sections is costly to clean and provoking to the men who are assigned to clean it. The exhaust can be supplied either by a blower or a fan. . . .

The paint collected from water booths can be reclaimed. (See article in INDUSTRIAL FINISHING for May, 1942 and Feb., 1943.) This has some advantages for single color spraying.

The exhaust stack should always be as straight as possible because every elbow or turn builds up resistance and cuts down the effectiveness of the exhaust. At no time nor at any point should the exhaust stack be smaller than the diameter of the exhaust fan inside the exhaust pipe.

The weather cap at the top of the stack deserves particular attention, as an excellent exhaust can be ruined by an improper design or positioning of the cap. If a plain cap is installed, such as the average sheet metal worker puts on, you should be absolutely sure that the cap has sufficient clearance to allow all of the air exhausted to get out. A rule to follow here is to have the space between top of stack and low edge of cap no less than the radius of the stack. For example, if you have a stack 24-in. in diameter (12-in. radius) the space between the top edge of the stack and the low edge of the cap should be at least 12-in. A space of 14-in. would be better.

Velocity of Exhaust Air

The effectiveness of a spray booth depends directly upon the velocity of the air that passes through the booth. The velocity should be no less than 100-ft. per minute. I insist upon 150 to 200 feet per minute and I find that the operators and booths are cleaner. The operators do not need masks, which interfere with production and cause discomfort. Many good spray painters won't work when or where they have to wear a mask. If the operator has to wear a mask I'll bet the paint department is a dirty and unhealthy place in which to work. If you have this condition, I suggest you call in your spray equipment salesman. He will tell you how you can correct your bad conditions and make the place a more pleasant one in which to work. The change for the better will reduce your fire hazard to a minimum and your operators will turn out more and better work. I have made such changes and have proved that my theory is right. The cost is low for the tremendous benefits received.

NOTE—To calculate the exhaust of a spray booth, the following formula is used:

Height of spray booth, times width of spray booth, times velocity of air desired, equals spray-booth fan capacity.

Example: Suppose the spray booth is 7-ft. high and 10-ft. wide;

● O'Brien has had wide experience and success in this important new field. For the "interior" side of plywood sections O'Brien's Clear Lacquer Sealer and Special Semi-lustre Synthetic Varnish provide an excellent two-coat finish. They are easy to spray on large surfaces, extremely dependable, and they air dry so quickly that the sections can be sanded or handled in twenty minutes. For the "exterior" side, on either plywood or tempered presdwood, O'Brien's Exterior White Primer offers similar unusual production qualities.

Makers of pre-fabricated houses and anyone finishing large wood surfaces on a production basis are invited to examine these products.

O'BRIEN VARNISH CO., South Bend, Ind.

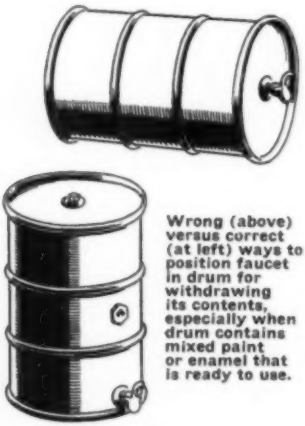
and we want an air velocity of 150-ft. per minute. Multiplying 7x10x 150, we get the figure 10,500. The fan should be of a size that will move 10,500-cu. ft. of air per minute.

It is always well to purchase a larger capacity fan than the formula calls for to compensate for any friction loss or resistance from obstructions in the duct line.

Withdrawing Paint From Drum

WITH so many inexperienced and untrained employes entrusted to important work in and around factories today, we can expect some ordinary things to be done wrong occasionally. Here is a typical case:

We received a complaint about our black lacquer, which is made and used according to Government specifications. This material is shipped in drums and arrives at the user's plant already thinned and ready for use.



Wrong (above) versus correct (at left) ways to position faucet in drum for withdrawing its contents, especially when drum contains mixed paint or enamel that is ready to use.

Upon investigating the complaint about our material, our local representative found that a drum of black lacquer had been positioned on it side and the faucet had been placed in the hole in the center of the drum head. (I suppose they intended to tilt the other end higher and higher after half of the contents had been withdrawn.) In the first place, this hole in the center of the drum head is there to receive the extended shaft of an agitating device which is used to stir the contents of the drum.

The contents of this drum hadn't been stirred nor had the drum been rolled or shaken or vibrated, therefore some of the pigment had settled. What was being drawn through the faucet in the center of the drum head lacked sufficient pigment for the work at hand, so a complaint was registered with the paint manufacturer.

Upon the recommendation of our local representative, the faucet was replaced with a plug in the drum head, the drum was rolled and upended a few times to agitate its contents, and finally it was set on end and the faucet was inserted at the side near the lower end, as shown in the accompanying drawing. This simple procedure remedied the trouble — and saved our material from being rejected. A daily stirring of the contents is sufficient to keep the pigment properly mixed with the vehicle and in satisfactory suspension. — CARL J. SCHUMANN, *President, Hilo Varnish Corp.*

Oil, water and sediment in the compressed-air line that supplies spray guns, causes more trouble than you realize. There are ways to avoid this. Find out about them from your spray equipment manufacturer and save added expense.

Which of These... SPECIFICATION FINISHES Do YOU Need?

- Quick Drying Metal Primer
- Lacquer
- Paints for Ammunition
- Clear Phenol Baking Varnish
- Ammunition Lacquer Enamel
- Spar Water Resisting Varnish
- Aluminum Mixing Varnish
- Quick Drying Camouflage Enamel
- Dope, Cellulose, Acetate, Clear
- General Purpose Lacquer Enamels
- Lacquer for Shells, Bombs, Grenades, etc.
- Paint, Cavity — for Torpedoes

DON'T let the problem of securing the proper Government Specification Finish hold up your war production jobs. You can depend upon our chemists, with their broad experience in formulating Government Specification Finishes for many war products, to give you the finish you must have for the materials or equipment you are producing for the Army, Navy, Air Corps or Marine Corps.

Our many years of pioneering development work in producing exclusive varnishes and lacquers for Permite Ready-Mixed Aluminum Paints, and the facilities of our modern plant, are also at your service.

Clear and colored lacquers, zinc chromate primers, enamels, mixing varnishes, camouflage paints, rust inhibitors – custom-built to your needs to meet Government Specifications – are included in the Permite Line. We also supply Permite Aluminum Paints on WPB allocation.

Quotations on any finishing needs submitted promptly upon request.

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PERMITE *Industrial* ***FINISHES***

Screen Stenciling

USED MORE EXTENSIVELY IN WARTIME

BY BERT ZAHN

Graphic Art & Display Materials

A GREAT DEAL of interest in the silk-screen process has resulted lately, due to the many governmental departments specifying silk-screen application to numerous products. I realize that it is a simple matter to write about how it should be applied, or how certain types of jobs are silk-screened. Of course, to persons unfamiliar with silk-screen reproduction, this work is hard or impossible to understand. In this article I will attempt to tell not only what is being done or what can be done, but to explain the procedure of doing it.

Stenciling Shells and Bombs

On shells and bombs, the code numbers, etc., are being put on by a brass stencil and an airbrush, a printing unit, or the silk-screen process. My sketch marked Fig. 1 shows a loose stencil which is wrapped part way around the upper cone of a shell, so that paint can be applied with a squeegee. The stencil is made of No. 10 or No. 12 silk, with a film attached to the silk.

The sketch marked Fig. 2 shows the automatic high-speed method which is similar to that used by the glass companies to imprint names, trademarks and slogans on bottles, glasses, etc. The machinery

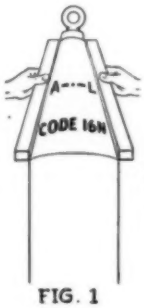

FIG. 1

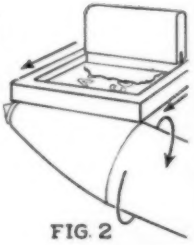

FIG. 2

Fig. 1—A loose stencil wrapped around cone of shell so that paint can be applied with squeegee.

Fig. 2—The automatic high-speed method wherein the shell rotates, screen stencil travels with it, and squeegee remains stationary.

will have to be built to fit the product. As the shell rolls or turns, the silk screen in contact with the shell moves with it. The squeegee remains stationary and forces process paint through the open meshes of the silk.

Boxes, Crates, Wrappings

Because of the short runs and odd sizes of many packages, printing is often impossible. A simple silk screen, which may be used

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over and over again as the demand arises, will be found useful and economical.

Clothing, Equipment, Etc.

Where temporary markings are required until cutting, sewing or applying other items to the original piece, and the guide marks are to be removed, a silk screen will answer the purpose. The color to use is a dry color powder mixed with water and very little binder, such as gum arabic. This color is easy to remove by either washing or brushing. In the case of a uniform manufacturer who had to place wiring in a certain place on each piece of cloth, this method solved the problem. Also, screen work has solved the problem of making flags, banners, pennants, and similar products.

Just recently the screen process has been used to mark tents, shelter halves, H. Q. equipment, case covers, etc.

Tanks, Automotive and Ordnance Equipment

On the inside as well as the outside of a tank, many instruments, levers and accessories have to be marked or described. Screen stencils of various sizes and shapes are being used for this purpose. All designating insignia and numbers on all Army and Navy equipment may be silk-screened. The advantage here is that the production medium can be taken to the job and completed, whereas, in the case of printing equipment, the job would have to be taken to the press.

Camouflage, Blackout and Luminous Material

Instead of an individual on the job going to long detailed effort to make directional markers with one or more silk-screen stencils, this

Fig. 3—Directional signs for use during time of blackout. These can be made in quantities by screen stenciling.

work can be centralized and great quantities turned out in a short period of time. This procedure permits a stock of screens to be used and, by changing the colors, one can have different area coverings.

Airplanes, Air Fields, Hangers, Military Buildings, Storage Igloos

Screen stencils are in great demand for marking air fields, zone areas and directional data, as well as ammunition storage igloos. This sort of thing has offered a tremendous field for silk-screen work. The screens are taken to the job to be marked, and the color or paint is screened onto the described surface. Where identification at night is desired without the use of direct light, glo-beads are placed onto the adhesive paint which has been screened on the surface.

Instrument Panels, Dials, Markers, Etc.

Where the problem of placing numbers, gauge marks or any other identification on any surface arises, the silk-screen method will be found to be excellent. Due to the flexi-

IN PLYWOOD FINISHING . .

one Swallow does not make a Summer

It takes more than one outstanding quality to provide adequate protection of plywood. Furthermore, qualities not considered important in the finishes for solid wood are essential for plywood.

During seven years of pioneering and specializing in the finishing of plywood aircraft, the coatings and systems we produced had to meet the *most* exacting requirements for the protection of the surfaces. Our TUF-ON Protective Finishes will, therefore, meet the requirements for *any* plywood finishing.

TUF-ON Plywood coatings are made in a range of types so that schedules and systems can be developed that will emphasize any quality requirement and still provide all the qualities needed to an adequate degree.

If you have a plywood finishing problem, get in touch with us.

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INDUSTRIAL RESEARCH DIV. OF WIPE-ON CORP., 105 HUDSON ST., N.Y.C.

bility of the process, and not being limited as to size, types of surface or quantity, no other method compares with the silk-screen method.

Different views of an automatic process printer are shown in Fig. 4. The rate of production varies anywhere from 200 to 2000 impressions per hour, depending on size. There are various types of machines on the market for different products such as the automatic press for putting copy on glasses,

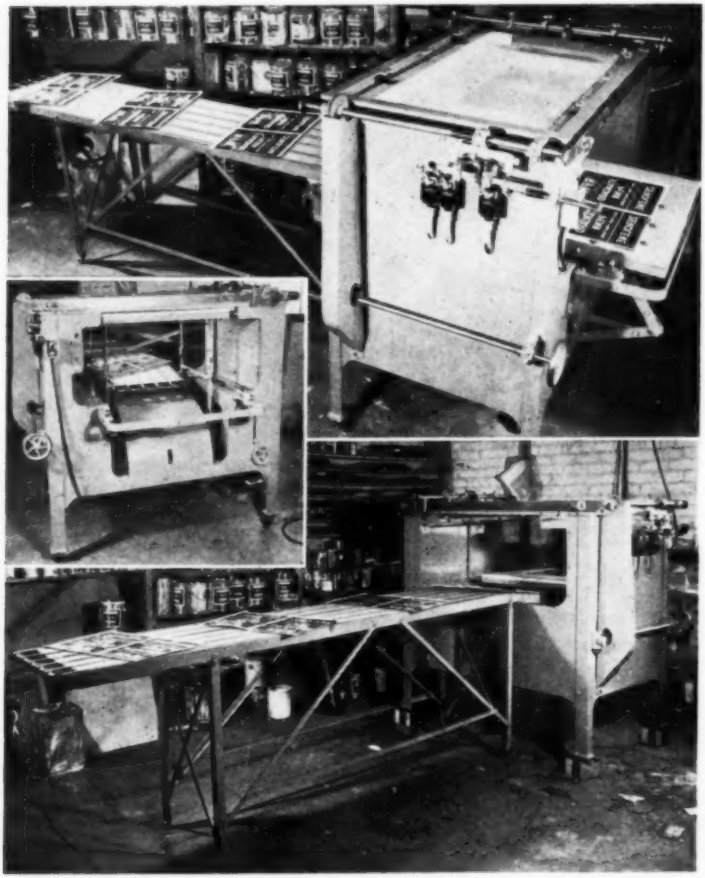

Fig. 4—Different views of an automatic power-feed silk-screen process printer.

THE
Difference
IS IN THE
Finish

If you are still making products for civilian use, beauty of finish is as important as ever. Finishing materials that possess both protective and beautifying qualities are still available in grades equal to or superior to those formerly furnished.

If your production is now confined to war products, we are supplying protective coatings that comply with U. S. Government specifications and give a good account of themselves under the severest tests.

No Tampering with Quality

Your inquiry will receive our prompt attention.

ROCKFORD VARNISH *Company*
ROCKFORD, ILLINOIS

Manufacturers of Protective and Decorative Coatings

bottles, etc., and the specially developed press for book covers, etc. All use the silk-screen process as a basis for reproduction.

Highway and Directional Markers

Here again, silk-screen stenciling is probably the most satisfactory method, as the signs can be done in the plant. Later when they need to be repainted the screens can be transferred by highway truck to the job and the repainting and screening can be done without moving the signs.

Now that we realize it is difficult to absorb enough information from a magazine article, the author and editor are pleased to open these columns to your specific problem. Just let us know what you intend to reproduce, and on what, with any other necessary information, and we shall try to assist you in solving your problem.

Fig. 5—Highway directional markings and warning signs of identical size, color and design are frequently ordered by state highway departments.

Acid-Proof Top Finish

IN A recent issue of this magazine a question was asked about an acid-proof table top finish. This is the formula which I included in an article some years back:

Iron sulphate	(parts)	4
Copper sulphate		4
Potassium permanganate		8
Water		100

Apply two coats of this mixture, allowing reasonable drying time between coats. Then wipe off the surplus salts that remain after drying. Then apply two coats of the following mixture:

Aniline	(parts)	6
Hydrochloric acid		9
Water		50

This will take several hours to turn to an ebony black. When it turns black and is thoroughly dry, fill the wood with a mixture consisting of three parts of linseed oil and one part of turpentine. Heat this mixture by placing the container in boiling water, to keep it safely away from an open flame. Wipe off the surplus oil and allow the surface to dry.—J. K. COOPER.

Metal Washing Machines

American Foundry Equipment Co., 555 S. Byrkit St., Mishawaka, Ind., has recently announced the addition of a Metal Washing Division for designing and manufacturing washing machines for industrial purposes.

The new Metal Washing Division will design and build machines for the removal of chips, dirt, grease and oil from machine parts, stampings and other manufactured products.

Batch type machines are available as well as large continuous conveyor and monorail-spray types to incorporate such sequences of operations as wash and rinse; or wash, rinse and dry, or special processes for the surface treatment of metals.

The machines will be suitable for solvent-emulsion degreasing or alkali cleaning. Drying will be accomplished with a high efficiency recirculating air system. Machines will be steam, gas or electrically heated and can be supplied complete with controls.

IS THERE A PRODUCTION JAM IN YOUR FINISHING DEPARTMENT?

In the recent case of an armament manufacturer, specifications called for the use of a good slow drying primer for finishing trench mortars, but the drying time was so prolonged that production was impeded. M & W technicians were called in. On their recommendation, and with Government approval, a speed primer and radiant heat drying were substituted. Drying time was improved, and the bottleneck eliminated without impairing the quality of the finish. ☆ Send for booklet, "Information on U. S. Government Specification Finishes," containing an up-to-date list of specifications and the M & W finishes which meet them. If, for any reason, you need special finishes or the help of our engineers on any finishing problem, your inquiry will have our prompt attention.

MAAS & WALDSTEIN COMPANY, NEWARK, N. J.

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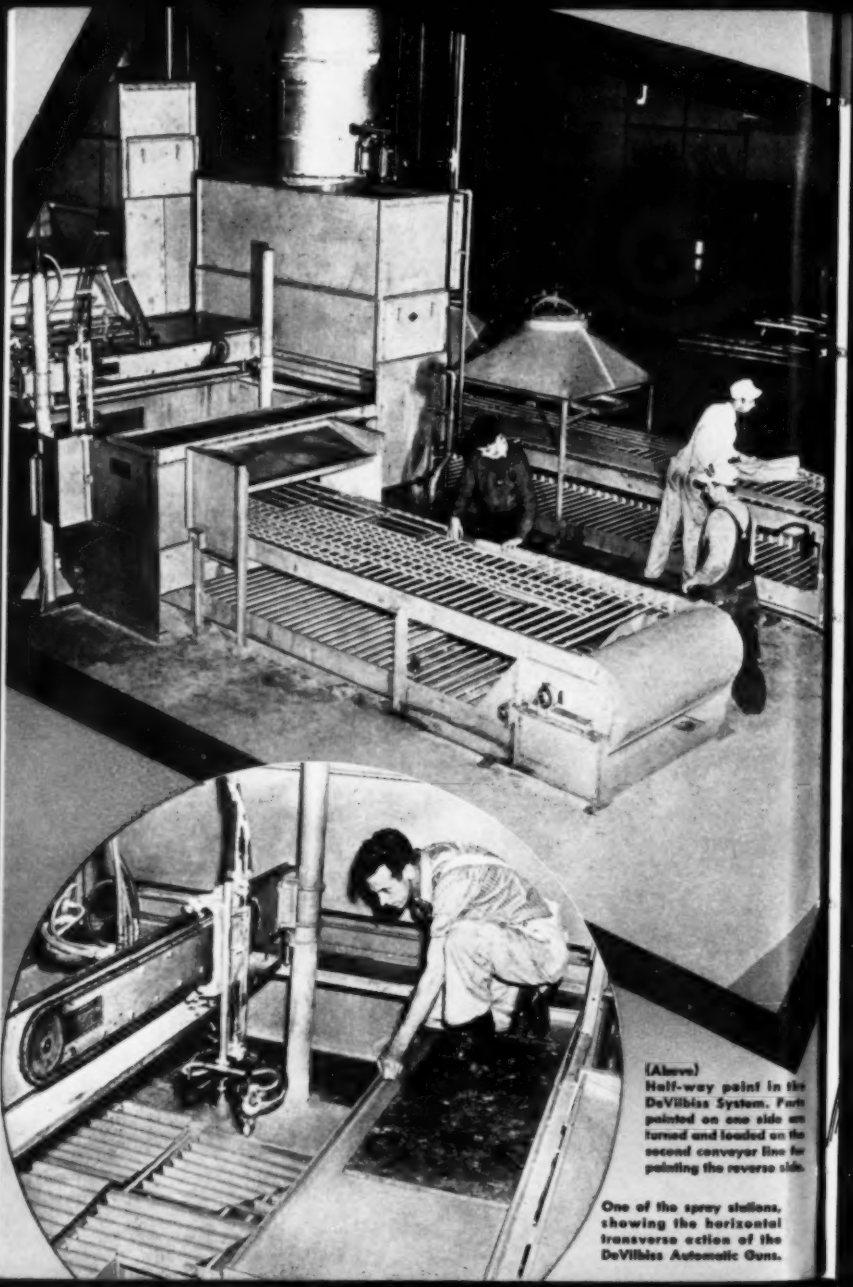

(Above)
Half-way point in the DeVilbiss System. Parts painted on one side are turned and loaded on the second conveyor line for painting the reverse side.

One of the spray stations, showing the horizontal transverse action of the DeVilbiss Automatic Guns.

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The ROBOT Painter

Automatically coats small plane parts of all sizes and shapes

Here's how The Glenn L. Martin Company solved their problem of speeding the painting of small parts for Army and Navy bombers. And other war plants can take the tip.

It's a "robot painter" designed by DeVilbiss engineers to automatically coat small bomber parts with an anti-acid paint that resists corrosive elements. All sorts of pieces—from angle bar strips to corrugated sheet sections—are sprayed at one time and with amazing speeds.

This DeVilbiss Machine is a manpower saver, too. Five men and this "robot" can do in 8 hours what formerly took 15 men to do on three shifts. Because of this Martin has been able to transfer more than 40 men to other bomber production work where men are urgently needed.

If you are making small war equipment parts and are being pressed for faster deliveries, in spite of the manpower shortage, perhaps DeVilbiss can develop a "robot painter" that will produce similar results for you.

ARMY E NAVY

PROUD to have won the coveted Army-Navy "E" for excellence in war production, the men and women of DeVilbiss pledge to continue giving their all-out best—for Victory.

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Send today for this valuable book. Use it as a purchasing guide and as an instruction manual for mixing, thinning, applying and drying these EGYPTIAN Superior Finishes. They're made with the same meticulous care that has gone into every EGYPTIAN Finish for over a half century. Long before the War we were making successful finishes to U. S. Gov't specifications and to meet exacting specific requirements of private firms. Such experience counts in times like these. You can rely on EGYPTIAN "Spec" Finishes to serve you faithfully and well.

Ask for U. S. Government "SPEC" Book IF

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EGYPTIAN FINISHES

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Wide Stripes on Curved Surfaces

BY NORVEL S. THOMPSON

THE application of wide stripes is often something of a problem, especially when you have curved surfaces and a large number of products to stripe. By "wide stripes," I mean stripes that are ¾-in. wide or wider. Striping tools can be easily used to put on the narrow stripes. Of course, where you have only a small number of articles to stripe, you can use masking tape. However, the time and labor involved in carefully applying and removing masking tape amounts to something when many products must be striped—even when the number only runs into the hundreds.

A suggested method, offered by one of the men in our Time Study Department, was to devise a masking fixture or jig. His idea was to attach this fixture to the product (or vice versa), spray the surface to be striped, remove the fixture, and the job would be complete except for drying.

Our problem was to spray a ⅞-in. wide grey stripe around the lower edge of a cabinet base which has both straight and curved surfaces. A drawing of the sheet-metal base is shown in Fig. 1.

We did considerable experimenting before we developed a jig that was satisfactory. Since three sides of the base have to be striped, we decided to make a frame into which it could be fitted. The curved surfaces, including both convex and concave curves, presented a real problem. We had to have a masking shield that would fit up closely against these curved surfaces, as well as against the flat sides.

Various means of applying pressure at different points were tried, and a number of different materials, for the masking shield, were

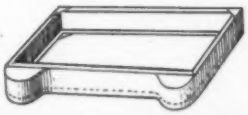

Fig. 1—Our sheet-metal cabinet base required a ⅞-in. stripe around the lower edge, at front and sides.

checked before one was found that answered all requirements. We assumed, at the outset, that the pieces being striped would vary somewhat in contour and that the masking shield itself would have to be made of fairly flexible material. Thin-gauge sheet steel was the first material tried. It formed around the convex surfaces perfectly, but it did not serve satisfactorily on the concave surfaces (the inside bends). This preliminary work in-

dicated that a thicker but equally flexible material would be necessary.

The next material tried was cloth impregnated with a phenolic resin, specially treated to give maximum flexibility. This material (available in various thicknesses) seems to fill

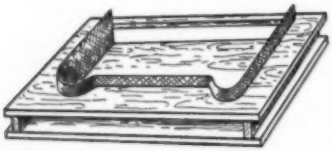

Fig. 2—The masking jig without its clamping fixture. It includes a plywood base B, plywood cut-out member C, and flexible masking shield M.

all the requirements for the masking surface, and it can be easily cleaned. It is not affected by the ordinary paint reducers and solvents.

The construction of the jig required movable arms that could be used to force the flexible shield against the piece being striped. To keep the operation as simple and efficient as possible the number of

Fig. 3—The clamping-arms assembly, hinged at two places. Its working edges are faced with rubber.

movable arms was kept at a minimum. To assure uniform width for the stripe, a perfectly flat and level piece of thick plywood was selected for the base of our jig. Above this base we placed a piece of plywood which is cut out to conform to the shape of the piece being striped. It is fastened to the base as shown in

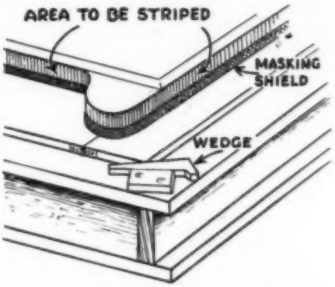

Fig. 4—A corner of the complete assembly, with cabinet base firmly clamped upside down in the fixture, so that only 7/8-in. of its edge shows all around. This exposed area is the part sprayed to make the 7/8-in. stripe. An eccentric can be used instead of the wedge, but it must be positioned just right to work satisfactorily.

Fig. 2. Inside of this cut-out pattern, the flexible masking shield is placed loosely.

On top of this cut-out pattern we placed the hinged arms (Fig. 3) which are also cut out to conform to the contour of the piece to be striped. With the product positioned in the jig, the movable-arms assembly is pushed against the flexible masking shield to press it tightly against the surfaces to be striped. Wedges or eccentrics at the extreme corners or "shoulders" of the movable arms, are used to draw the arms tightly against the piece, as shown in Fig. 4. This clamping action provides tight contact to both the concave and convex surfaces. Releasing the wedges after the piece is sprayed, causes a natural springing away of the masking shield. The piece is now striped and free to be lifted out of the pattern and allowed to dry.

Several refinements in this jig are necessary for best results. The flexible masking shield should be made more rigid along its straight sections by attaching blocks of

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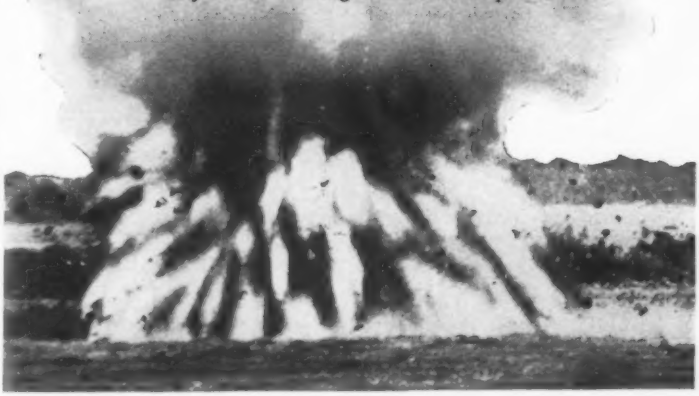

CLEARING THE A

HOW BINKS WATER WASH SPRAY BOOTHS HELP TO

General view of Binks Down Draft Water Wash Spray Booth described to the right.

The same booth showing the filters in the ceiling through which clean air enters, and the grills in the floor through which fumes and dust are exhausted. Arrows show direction of air movement.

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wood to the back side of the shield. The blocks should be as high as the space between the base of the jig and the top platform. This construction really serves a twofold purpose. The blocking, put on in this manner, keeps the masking shield in one place at all times; thus you have a positive guarantee that the stripe will always be uniform.

Then, also, the contact surfaces of the clamping arms should be faced with rubber. This resilient facing provides a cushioning effect and it also distributes the pressure against the masking shield evenly around the surfaces being sprayed. The rubber may lose some of its resilience by repeated cleaning with solvents, but it can be easily replaced. If the rubber is covered with masking tape it will remain resilient indefinitely.

At the outset this method of striping appeared impractical. However, results speak for themselves. Today, instead of running 300 pieces in lots of 60, stretched out over the entire week, the whole lot can be striped in one day. Our workmen do the job rapidly, safely and with accurate precision.

Frolics in the Finishing Room—14

BACK in the days of hand staining (and even today in some places) finishers' hands became so stained with color, deeply imbedded in the pores of the skin, that they were extremely difficult to clean. The beginner—always fair game for practical jokers—was often led to believe that this deeply imbedded stain could be washed off with warm water and soap. When the victim found that the stain wouldn't all wash off readily, Mr. Practical Joker would step up and offer something "that would really cut the stain" and enable the man to wash his hands clean. By this time the average young fellow was eager to try anything.

For the final climax to the joke, a solution of black nigrosene, made up plenty strong and kept handy for such occasions, was offered to the victim. He was definitely assured that this stuff would really work, notwithstanding its black color. Well, if he followed this suggestion he would end up with a pair of the blackest hands he ever

saw, and this deep permanent black would have to wear off with time. It would usually require several weeks, during which time the victim's hands would be a hideous spectacle, especially if he were courting a dainty sweet young lady.

Of course the fellow who pulled this dirty trick would do well to size up his victim first, and speculate on what the reaction might be. Sometimes it ended up in an open fight. Occasionally the victim bided his time and paid back his tormentor secretly with heavy interest.—F. W. WORTH.

Editor's Note: Write up and send in an account of some funny happening in the finishing room or paint shop. We can use it.

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Automatically Coating Steel Shell Cases

STEEL shell cases rolling off the conveyors of the automatic airpainting unit, at the Northwestern Corp. plant in Morris, Ill., are impressive testimony to the great importance of product painting in war production. The application of a protective film of phenolic varnish to this war product brought on many finishing problems; but the problems were licked, the job was done. The tests were successfully passed—and now, in American factories, steel shell cases are a production reality. While sizes from 20-mm. up to 105-mm. inclusive, are to be coated, those at the Northwestern Corp. are the 37-mm. size.

Before going into the finishing methods employed at this plant, it will be well to understand the use of the product and its development. An artillery shell is made up of many component parts. There is the projectile which is propelled through the air—and this may, in turn, incorporate fuse parts, etc., depending upon the type of shell. Then there is the shell case which contains the propelling charge.

Steel Shell Cases Require Protective Coatings

Formerly, shell cases were made of brass and required no protective coating. When it became imperative to conserve brass to the utmost, the idea of drawing steel shell cases was reborn. We say reborn because as far back as World War I, experiments were being conducted along these lines. Prior to the present war there was an adequate supply of brass, so until several months ago, the need for the switch was not foreseen. When the need did become acute, American ingenuity triumphed once more.

When the case made of steel was found to be practicable, attention was focused on the protective coating required. The interior and exterior had to be coated perfectly. Deep down in the cylindrical body the coating had to be as flawless as the most easily reached outside surface. The performance requirements of the finish were very exacting.

The protective film must not soften under the sudden intense heat created by the explosion of the propellant. The interior film had to provide absolute protection for the metal against the chemical action of the explosive charge. The exterior had to stand rough handling, abrasion and salt spray. It must not be affected by moisture, mild caustics or oil. It must be elastic enough to stand a crimping operation after the projectile is inserted.

To top it all, the specifications, AXS-736, required the film thickness to be .0006-in. with a plus or minus of .0001-in. Here was a precision coating job for automatic painting equipment. Engineers im-

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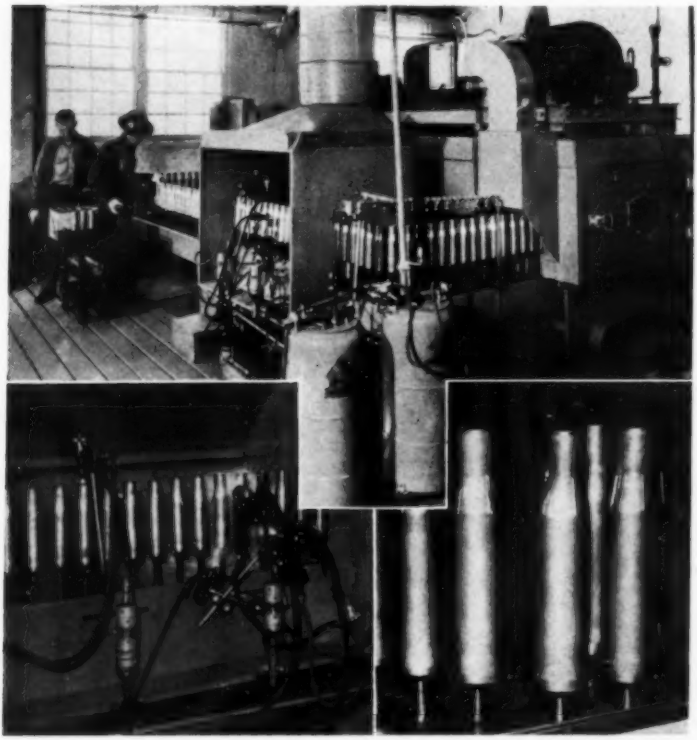
mediately went to work. They designed and built machines for the job, and proved that the finish could be applied on a production basis.

Now let's see how these shell cases are being coated at the Northwestern Corp. on such a machine which, in this case, occupies approximately 15-ft. by 18-ft. of floor space and has 350 spindle assemblies set at 3-in. centers.

The shell cases are brought to the airpainting machine in wire baskets after they are cleaned and rustproofed. They are loaded on holding fixtures which extend into the primer hole for support. They



Top picture shows shell painting and drying unit. Loading and unloading station is at left. Painting insides and outsides of shells takes place automatically inside the booth. Drying occurs in the gas-fired oven at right.

Lower left shows a close-up of interior-painting gun and exterior-painting gun in operation.

Lower right shows a close-up of painted shell cases entering oven for a 20-minute baking period. Photographs, courtesy of Paasche Airbrush Co.

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are conveyed to the first coating station in the booth, and while directly under the single vertically-mounted gun, the interior is coated. They continue to the second station where the exterior surfaces are coated. Both "interior" and "exterior" guns are mounted on oscillating arms and follow the work while spraying. The shell cases are rotated during both operations by a special spindle rotating unit. The positive action of this mechanism assures remarkable uniformity of finish.

The work moves along for a short air-drying period and then enters a gas-fired oven for a baking cycle of 20 minutes at 400° F. Emerging from the oven, the cases continue on the conveyor for about three minutes to allow them to become cool. Then they are removed from the fixtures, the primer holes are coated, and then comes inspection.

Finished shells are carefully inspected before being packed in cartons. At regular intervals the coating is subjected to a series of tests. Photo, courtesy of Paasche Airbrush Co.

Now let's go back to the actual coating of the work. Automatically air-operated oscillating-action airbrushes atomize the material uniformly to the inside and outside surfaces of the casings to produce a glass-like finish.

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A dual pressure-tank system is employed. The merits of this system are demonstrated every day. While one tank is being cleaned and refilled, the other one is in use. No time is lost; production is not held up. The covers of these tanks also contribute greatly to the speed and ease of material handling, as they can be removed in about five or six seconds by merely raising a lever and removing the eccentric locking bar.

Because of the uniform finish required, it is absolutely necessary to maintain accurate airbrush setting, as well as air and fluid pressures. This is greatly simplified by special exclusive features of the unit. For instance, when the air regulators governing air and fluid pressures are set, the adjusting assemblies can be locked in place. The micrometer-calibrated controls and indexed fluid-needle controls on the automatic airbrushes make it a simple matter to set the guns at pre-determined calibrations.

Evidence of the fine job being done at the Northwestern Corp. plant is the fact that, out of every 1000 shell cases finished, an average of 998 are declared perfect and pass final inspection.

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Role of Lacquer Sealer

I have written this article with regard to the use of lacquer sealer in the furniture industry. I have tried to bring out my thought that the quality of a majority of furniture finishes on the market at the present time is not as high as comparable finishes in other industries.

I believe that increased production schedules and a desire to lower the cost of furniture has prompted several manufacturers of furniture to insist upon a lower quality finish. In many cases I believe that the importance of the sealer is overlooked.

BY RAYMOND C. ADAMS
Chief Chemist
Standard Industrial Products, Inc.

IT SEEMS to the writer there is a tendency among furniture manufacturers to overlook the importance of a quality finish. We all realize that for the past several years it has been necessary for the manufacturer to increase production and make all possible savings in order to be able to compete with the ever-lowering price market. On the other hand we must not overlook the fact that to the average person a piece of furniture is no better than its finish, regardless of the structure and fine workmanship involved. Also, the finish must hold up as long as the structure, because if the finish deteriorates the structure itself is of little value.

With this thought in mind let me ask you if you are one of the buyers of finishing materials, or a finishing foreman, whom the writer has heard say many times:

Buyer No. 1

"We use a cheap sealer but use a high quality 'top coat' lacquer. After all, all the sealer does is prepare a smooth surface; it's the 'top coat' lacquer that must be good."

Buyer No. 2

"We can cut this manufacturers sealer more than we can his competitor's and since thinner is cheaper than sealer we are able to materially reduce our cost."

Buyer No. 3

"We aren't interested in using any sealer that doesn't have at least 23% solids (or some other figure) at the gun."

Buyer No. 4

"Look at the way this sealer powders. That's the best sealer I ever saw."

Buyer No. 5

"We buy our sealer from several finishing houses but only use one 'top coat' lacquer. The reason for this is that anyone can make a good sealer, but making a good 'top coat' lacquer is another story."

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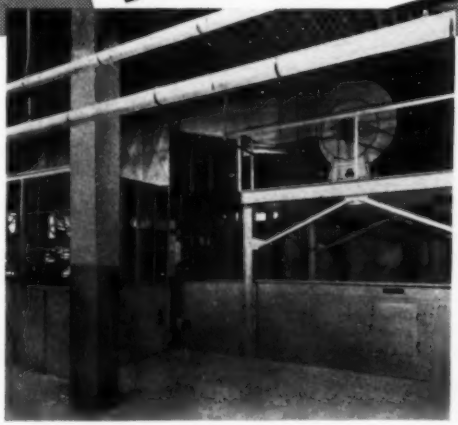

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IT'S ONE THING to be given a set of specifications. But, as you know, it's an entirely different thing to make these specifications work in YOUR plant . . . on YOUR product.

The reason for this is simple: no two plants have identical equipment. Take baking ovens, for example. There are gas ovens, electric ovens and infra-red ovens . . . new ones and old ones . . . ovens of every size and temperature. It's logical that specifications which work out satisfactorily for one finisher may bring perplexing problems to another.

But that's where the Du Pont War Service Man comes in. It takes *experience* to work out problems like these, and your Du Pont Man has been doing this type of thing for years. He's a specialist in paint viscosities and temperatures . . . spray-gun handling and adjusting . . . baking and drying procedures . . . everything to do with finishing. If possible, get his advice before you start processing for given specifications. Or, if you've already run into a problem, call on him immediately.

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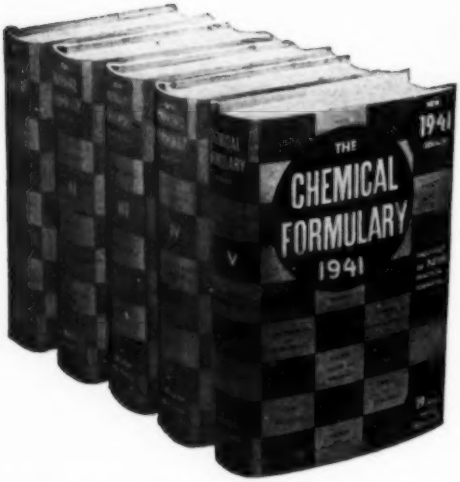

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These and other statements have been brought to my attention many times, as the reason one sealer is preferred to another. The purpose of this article is to present a true picture of the role played by sealer (all references to sealer refer to the lacquer-base type) in the building of a finish for wood furniture. Too often the tests or particular qualities, which the buyer or finishing foreman expects of the material, are insufficient to determine the true merits. Let's consider Buyer No. 1, who says:

"We use a cheap sealer but use a high quality 'top coat' lacquer. After all, all that the sealer does is prepare a smooth surface; it's the 'top coat' lacquer that must be good."

A logical approach to this remark is to first ask ourselves, "Why is sealer used?" To this we answer, "to prepare a foundation upon which our finish is to be built." To be a good sealer it should have the following properties:

1) Good adhesion to wood.

2) Offer a surface with good build to which following coats of lacquer (or varnish) will adhere.

3) Permit sanding in 30 to 60 minutes, to a smooth even surface, with relatively little clogging of the sandpaper.

4) Withstand cold checking.

5) Withstand printing.

There are other less important qualifications but any sealer that

passes these tests will almost automatically pass the others.

The old adage that a chain is no stronger than its weakest length is most assuredly applicable to a finishing system. Unless a sealer meets the specifications outlined above how can the entire finish be expected to withstand cold checking, printing, etc. To express this in a practical everyday manner, let me ask you this question: "Which would you rather have? 1) A new inner tube made of a cheap grade of rubber and a new first-grade tire; or 2) a new inner tube made of first-grade rubber and a new first-grade tire?"

The answer is obvious. The answer is just as obvious in the case of the low-quality sealer and the high-quality "top coat" lacquer, as compared to a high-quality sealer and a high-quality "top coat" lacquer.

Buyer No. 2 declares that:

"We can cut this manufacturer's sealer more than we can his competitor's and since thinner is cheaper than sealer we are able to materially reduce our cost."

Have you ever asked yourself just why thinner is used? The primary reason is that thinner, by controlling the consistency of sealer, permits it to be applied by spraying in a uniform film. As you already know, a spray gun will not atomize a viscous sealer. The consistency must be just right to obtain maximum results.

What Lacquer Sealer Is and Why it is Used

The composition of lacquer sealer may be divided into two components: Solid ingredients and thinner ingredients. The solid ingredients are dissolved in the thinner, and when the sealer is applied they are evenly distributed over the surface. As the sealer dries, what actually happens is that the thinner evaporates from the surface, leaving only the solids to form what we know as the film. In other words the thinner has absolutely no bearing upon the quality of the sealer film—if, of course, the thinner has the proper evaporation rate so as to permit the atomized particles to flow together to form a homogeneous film free of pinholing, orange peel, blushing, etc.

You might ask this question: "If thinner doesn't have anything to do with the quality of the sealer, why is it that manufacturers of thinner claim to have various prices and qualities?" You can easily answer this yourself. Experience has taught you that it is much more difficult (and sometimes almost impossible) to rub to a beautiful satin finish a lacquer film that contains pinholes and orange peel, than it is to rub a lacquer coating that has flowed out evenly and uniformly.

Cutting Sealer with Thinner

As explained previously, one function of thinner is to give that desired flow to the material. It so happens that some thinners perform this service much better than others, thus we have various classes of quality. It usually happens that the thinners that give the best results are the most expensive, hence the reason for the various prices. Also, some thinners are better solvents for the solid ingredients for the sealer, thus permitting a higher concentration at spray viscosity.

Many old-time finishers have asked me why sealer isn't as good today as it used to be. They explain that in the good old days you could cut a sealer from 50% to 100% for spray application. It

industry's new name for top efficiency in wafer-wash

*AQUA-RESTOR

*Reg. U. S. Pat. Off.

PAINT SPRAY BOOTHS

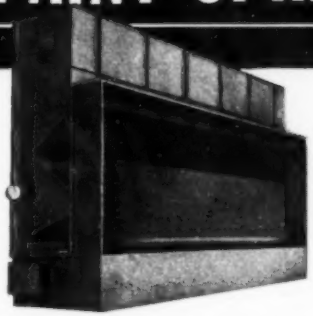

PHOTO: Aqua - Restor Paint Spray Booth. Rear water-impingement walls; construction permits addition of our standardized side walls and roof panels.

What's ***your*** paint spraying problem? More production, ***better*** production? Does your operation require greater safety for labor, and against fire? Aqua-Restor units, developed to meet high-speed high-standard War Production spraying, check high on these points. Continuous water curtain, completely controlled; no "shower" or spray; no nozzles, no moving parts —minimum of servicing required; low h. p. pumping, unusually high paint reclamation. 23 standardized units; others engineered to specification, for all spraying requirements. WRITE FOR BULLETINS.

AQUA - RESTOR DIVISION

MAYER MANUFACTURING CORP.

43-53 DIVISION PLACE **BROOKLYN, NEW YORK**

doesn't make any difference in the final finish whether the finisher does the thinning or whether it is done by the finishing material manufacturer, as there is only one concentration of solids that can be obtained at spray viscosity by any particular sealer.

In recent years the tendency has been for the manufacturer of finishes to supply the sealer in a ready-to-spray consistency, rather than in a heavy form that must be cut before using. The reason for this is that the manufacturer is in a better position to reduce the material to the proper consistency in his mixing tank, thus giving a uniform mix to all batches.

When the thinning is done in the finishing room it is usually done by guesswork and frequently by new employes or workmen who are not familiar with how it should be done. I think this can best be explained by citing an experience which I once had.

Ready-to-Spray Sealer Ruined by Dumb Thinning

A very large manufacturer was buying a blue lacquer in a concentrated consistency that required a 100% reduction (half and half) with thinner before spraying. We succeeded in showing him that if he would use our lacquer we would supply it in a ready-to-spray consistency so that he would be able to apply pressure direct to the drum and thus spray 55 gallons without running out of material. We also pointed out that in buying our material in the ready-to-spray consistency he would save the expense of mixing, thus reducing fire risk by avoiding spillage. At the same time he would be assured of absolute uniformity from batch to batch. After trying out a 5-gallon batch he placed a 10-drum trial order. We were indeed happy. However our feeling of satisfaction was soon broken when a few days later we received a telephone call from him explaining in no uncertain words that our lacquer was no good and that he was returning the entire 10 drums.

Immediately I jumped into my car and drove at break-neck speed in order to get to the plant and investigate. I was a licked pup, even before I arrived. And I certainly didn't get any consolation from the two finishing foremen whose departments were at a standstill as a result of the trouble.

It seemed that our lacquer just didn't have any body or coverage. When it was laid on heavy enough to cover, it dripped all over the floor. The first question I asked was whether or not it had been reduced. I was assured that it hadn't because they knew it was ready to spray. It seems, however, that they had forgotten to inform the man, whose job it was to do all of the thinning and keep the sprayers supplied with material, that this material was ready to spray. Upon overhearing the conversation he spoke up and said that he had cut it 100% just like he had been doing for years. No one had told him any different.

Naturally this solved our problem, but it also shows that even in one of the largest furniture plants in the country, mistakes in thinning are bound to occur. After all, very few finishing rooms have the proper laboratory equipment to measure viscosity. Certainly, no chemist could do any better and probably not as good a job of thinning to the exact viscosity without proper laboratory apparatus.

The most accurate way of determining your sealer cost is to determine in dollars and cents the amount required to coat each article. Such a method as this takes

FAMOUS FINISHES

Rigid scientific control and extreme care in manufacturing assure uniform high quality in Pittsburgh Industrial Finishes

IN MANUFACTURING Pittsburgh specification finishes for industrial users, "rule of thumb" methods are ruled out. *Every step in the production of these famous finishes is a precision operation.*

MEASURING—Automatic scales measure the exact quantities of every ingredient used down to the smallest fractional amount the formula calls for. This accuracy is one reason why Pittsburgh quality never varies.

MIXING—Specially designed mixing machines insure even distribution of the pigment in the vehicle so that every batch will be uniform throughout.

GRINDING—The paste is put through Burstone, Bramley, Steel Ball or giant 5-roll Grinding Mills. These grinders break down the mixture until every pigment particle is coated.

BOTH raw materials and finished products are subjected to exacting laboratory checks. Pittsburgh laboratories are equipped with every mechanical testing device known to paint making—such as electronic machines, ultra violet ray apparatus, baking and freezing cabinets, accelerated weather wheels, salt spray cabinets and blistering test equipment. This painstaking testing is why Pittsburgh Finishes are *famous* for durability on all surfaces.

Free Advisory Service. Users of industrial finishes can save time and money by consulting with us. A Pittsburgh representative will be glad to call at your convenience.

PITTSBURGH PLATE GLASS COMPANY — Industrial Paint Division, Pittsburgh, Pa. Factories: Milwaukee, Wis.; Newark, N. J.; Houston, Tex.; Los Angeles, Calif.; Portland, Ore.—Ditzler Color Division, Detroit, Mich. — The Thresher Varnish Co., Dayton, O.

PITTSBURGH *Industrial* **FINISHES**

PITTSBURGH STANDS FOR QUALITY PAINT AND GLASS

into consideration that fact that some sealers will give better coverage than others because due to their better build, less material is required.

Well, let's move on to Buyer No. 3.

"We aren't interested in using any sealer that doesn't have at least 23% solids (or some other figure) at the gun."

The "Solids Content" Complex

The words solids-content is an expression the chemist quite frequently uses to advantage, but I can't see that it means anything in the hands of the buyer of finishing materials or the finishing foreman. After all, you aren't interested in sales talk. You are interested in results. The words solids-content don't mean any more in describing a sealer than does the statement, "I have a 10-tube radio," mean anything in describing a radio.

In stating that you have 10 tubes in your radio, you don't mention the name or whether it is a table or floor model. As a matter of fact, you don't even tell whether or not the radio works. We have come to assume that the more tubes a radio has the better it is, but that is just a general assumption and isn't always true. We have likewise been led to assume that a sealer of high-solids content has better build than one of lower solids content. This isn't always true, and I make this statement, even though I am one of those chemists who is constantly trying to get more solids into sealer. It makes good sales talk but not necessarily a better sealer.

One of my good friends in the furniture industry once said to me: "What do I care what the solids-content is. I'm not a chemist. I don't know anything about that stuff, but what I do want is the best possible sealer at the lowest possible price. As a matter of fact I don't even care whether it has any solids, so long as it does the job."

Authentic Information About "Solids Content"

You are probably interested to know how I can make the statement that greater solids-content does not necessarily mean better build. You are no doubt aware that in the application of one coat of lacquer on top of another coat, the solvents in the top coat soften and penetrate into the undercoat. As a result of this softening action, and the blending together, the film doesn't have as good a build as if the undercoat had not softened. Perhaps you have experienced this many times in your finishing room. You have found that you get much better build if you apply two coats of lacquer, with one hour's drying time between coats, than when you apply one double coat.

Considering this fact you can easily see that a sealer that has less tendency to soften under the lacquer will have better build than one of higher solids content that has a greater tendency to soften.

Identically the same thing happens with regard to spraying a second coat of "top coat" lacquer over the first coat of lacquer. I once ran a test and proved that two coats of one of our 21% solids lacquers gave better build than two coats of one of our ready-to-spray 27%-solids lacquers. When just one coat of lacquer was applied to the sealer, the 27%-solids material gave very much better build than the 21% because, in this case, there was no softening that took place between coats.

Considering these facts I strongly recommend that you judge the

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GET THE WAR JOB DONE

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Acid Resistant Paints	Japans	Varnishes
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Hilo has the "Know How" to make Government Specification Protective Coatings, to apply them to surfaces of all kinds and to adjust the coatings to factory conditions.

Tell us the Hilo Coatings in which you are interested and we will send samples and complete details for handling.

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build of a sealer by actual performance and not by its solids content.

Sealers that "Powder," and Some Mistaken Ideas

Remember what Buyer No. 4 said?

"Look at the way this sealer powders. That's the best sealer I ever saw."

In order that we might intelligently attack this problem, let us first ask ourselves why sealer "powders," and what good it does. The powdering of the sealer is due to a pigment that is incorporated, which has the property of easily powdering. Through the easy sanding—made possible by the addition of this pigment—it is possible to quickly, easily and with a minimum quantity of sandpaper, sand the sealer to a smooth uniform surface.

Not just any pigment will do this because, first of all, it must be transparent. Secondly, it should promote a surface to which other coats of lacquer will adhere, as well as have that important property of powdering. Although there are several pigments used, zinc stearate leads all others in this connection. Unfortunately zinc stearate, as do some of the other pigments, tends to produce a soapy like surface upon which it is difficult to obtain adhesion, in addition to its tendency to form a cheesy film.

There is a mistaken idea among finishers that the more the sealer "powders" the better it is. This is not true. If the sealer sands smooth with relatively little effort, and without clogging the sandpaper, that is all that can be expected. Inasmuch as an excessive quantity of pigment does detract from the quality, it is best to use as little as possible.

Anyone Can Make Good Sealer? Beg Your Pardon, it isn't Easy

Buyer No. 5 announces that:

"We buy our sealer from several finishing houses but only use one 'top coat' lacquer. The reason for this is that anyone can make a good sealer, but making a good 'top coat' lacquer is antoher story."

Just how anyone could get such an erroneous idea is beyond imagination. I can safely say that in testing the various finishing materials on the market today, I have tested fewer good sealers than good "top coat" lacquer. I believe that this bears out my contention that *it is more difficult to formulate a good sealer than it is to formulate a good "top coat" lacquer.*

There are a number of buyers who like to be nice to several finishing salesmen friends they have and, as a result, they try to divide up their business. Naturally they don't want to sacrifice quality or trouble to the extent of being a good fellow, so they usually divide up their sealer business, but stick to their regular source of supply on "top coat" lacquer.

I will admit that it is easy to throw a few raw materials together and come out with a sealer which, from all appearances, seems to be rather good. On the other hand, when you start throwing raw materials together to make a "top coat" lacquer, the results aren't quite as encouraging because such factors as leveling, toughness, rubbing, etc., must be taken into consideration. The reason for this is quite apparent when you closely examine the various factors.

What Happens when Finish Ages

It is relatively easy to obtain fair adhesion to wood with most any type of a lacquer product because the lacquer, being of low consistency and solids, has a ten-

dency to penetrate into the cells, thus leaving a film that is what you might say "reinforced with wood." At first this theory might seem a bit far fetched but various laboratory experiments that I have performed bear out this statement. This principle might be compared to the reinforcing of concrete walls or the use of laths in plastering a wall.

Experiments show that a sealer of only fair quality has unusual resistance to scratching with a finger nail and cold-checking when applied to wood, whereas when the same sealer is applied to glass it shows up as being easy to scratch and has poor resistance to cold-checking. Tests indicate, however, that after aging for several weeks the sealer finish on wood begins to lose this reinforcing strength, and its resistance to scratching and cold-checking approach that of the film on glass. Naturally the weakness of the sealer doesn't show up when the finishing foreman runs his tests and, as a result, he thinks it okay and goes ahead and uses it in production.

Many furniture manufacturers, buyers and finishing foremen take the attitude that as long as they aren't having any complaints the finish must be okay. This assumption is entirely wrong.

Manufacturer's Name on Product Makes Quality Imperative

Very few furniture manufacturers put their name or trade name on their products, as do the manufacturers of automobiles, refrigerators, stoves, etc. I think you will admit that these items do carry, on the whole, considerably better finishes than our furniture. You may come back with the statement: "Yes I admit they do, but they get more money for their product and can afford to put on a better finish." This is true, but I believe if costs' facts were compared between the finish on these articles and the finish on furniture there would be relatively little difference per square foot of surface.

In the case of the automobile, the stove and the refrigerator, the finish must be good because the manufacturer's reputation is at stake. His name is on the article. With the furniture manufacturer the situation is somewhat different. His name (as a general rule) isn't on his article and as a result the public cannot form any opinion as to what manufacturer has the best finish. If the finish on a piece of furniture is poor, the buyer can complain to his retail store where it was bought, but even then he gets very little satisfaction. He realizes that the dealer doesn't have anything to do with it and that he is likewise interested in selling the furniture with the best possible finish.

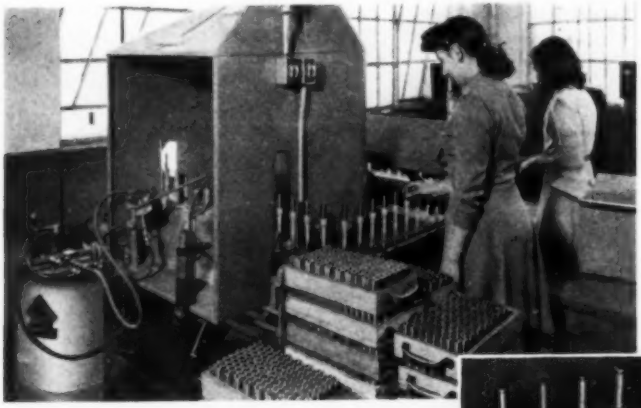
Complaints to Dealers About Poor Furniture Finish

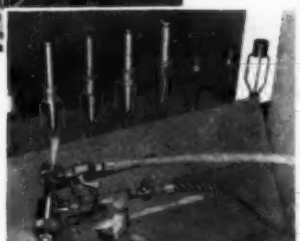
Did you ever, as a retail purchaser, buy a piece of furniture and have the finish go bad in from six months to two years time, and then try to get some compensation from the dealer? Probably 99% of the retail buyers of furniture don't even say anything to the dealer when a finish goes bad, because they know it wouldn't do them any good. The other 1% that probably do complain probably get an answer like one of these:

Answer No. 1

"We have been selling that manufacturer's furniture for over 30 years and have never had a complaint on the finish." *(To page 66)*

★ ★ Keen-eyed Inspectors must





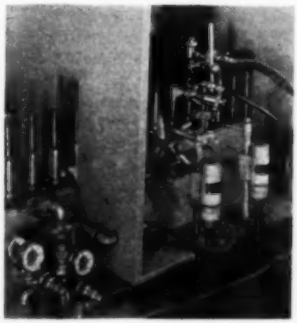
"Pass the Ammunition" **means more than just handing cartridges to a gunner. Inspectors must "pass the ammunition"** at every step in the manufacturing processes, working to specifications which really split hairs. That is because military men know the slightest inaccuracy is multiplied many times as a shell travels toward its target.

The coating of shell cases is a precision job too, the film thickness tolerance being + or — .0001", and Paasche automatic airpainting equipment is doing the job in stride. In one

Paasche AIRPAINTING EQUIPMENT

Manual, automatic and special airpainting equipment, airfinishing booths, pressure regulators, airconditioners for compressed air lines, air dusters and stripers.

"PASS THE AMMUNITION" First



plant, for example, 99.4 per cent of the finished cases are declared perfect and pass final inspection.

Picture above shows interior and exterior of 20 MM shell cases being coated automatically on a Paasche unit.

On the left-hand page, an operator feeds the conveyor of a similar Paasche automatic machine which coats the 20 MM projectiles. Inset shows Paasche unit in a shell-loading plant applying finish to an assembled shell.

Here, in the story of a 20 MM shell, you see illustrated the versatility of Paasche equipment, but you don't have to make shells to get the benefit of the inventive and creative ability of the Paasche organization. Their wide experience in developing airpainting units to improve quality, speed production and reduce cost of finishing, is available to you, without cost or obligation. Write for further information and literature on Paasche automatic or manual equipment.

Paasche Manual Equipment Speeds Production, Too!

1. Slanting fluid inlet and shorter fluid passage simplify cleaning. Swivels to any position in 360°.

2. Micrometer Calibrated Spray Pattern Control.

3. All working parts enclosed in strong machined brass body . . . protected against damage. Gun weighs only 22 ounces.

4. Conveniently located fluid control.

5. Easy grip handle, molded to fit the hand.

Paasche Airbrush Co.

1917 DIVERSEY PARKWAY
CHICAGO, ILLINOIS

Answer No. 2

"More than likely you were away from home for a few days during a cold spell and your fire went out. When you returned you built a hot fire and that caused your finish to weaken."

Answer No. 3

"What kind of furniture polish do you use? There are so many furniture polishes on the market at present that actually do your furniture more harm than good."

Answer No. 4

"There is nothing we can do after the furniture has been sold for six months."

I will estimate that not over one complaint, or at least what should be a complaint, in 10,000 ever reaches the manufacturer. Most all complaints stop with the dealer because he has been taught to believe that the best possible materials have been used to make up the finish. That is indeed a gross exaggeration. *Practically every furniture finish on the market today could be greatly improved and in most cases this improvement should start with the sealer.*

Whose to Blame When Furniture Finish Fails?

Most all manufacturers of finishing materials are in a position to give you this high quality. It isn't the fault of the finishing material manufacturer if you want one coat of lacquer to give you the build and appearance of two coats at the expense of sacrificing quality, to lower your cost per finish a few cents per item. It isn't his fault if you demand so much sanding pigment in your sealer, so as to make it sand so unusually easy, even at the expense of sacrificing quality. It isn't his fault if you prefer your lacquer so hard that it will dry in two or three hours for rubbing and packing. It isn't his fault if you insist upon getting a passable finish at less money, even though you sacrifice quality.

You think that you have really accomplished something in putting these almost impossible demands before finishing material manufacturers, simply because they have answered your demands, but let me tell you one thing: You have sacrificed quality in many instances.

Consult Your Finish Supplier When in Trouble

May I urge you at once to contact your finishing material supplier and ask him how he can improve the quality of your finish? In many instances your finishing materials will not cost one cent more. I urge that you give particular attention to your sealer. You wouldn't think of building an expensive house on a cheap foundation. Well then, don't try to build an expensive finish on a cheap sealer.

It is hoped by the writer that this article has given you sufficient evidence to impress upon your mind the importance of a good sealer in the final finish. You can't, by visual observation, determine the quality of a sealer in the manner that you can count the number of knots in a board. It is because of this fact that I wonder why the furniture manufacturer doesn't insist upon buying his sealer (and other finishing materials) in accordance with definite specifications. Prior to the war this might have seemed impossible, but in view of the fine job the Government is doing with paint specifications I believe this same method could and will be employed under civilian and peacetime production and conditions.

"Recognition"
Personal service to insure meeting production schedules.
Up-to-date information on specifications.
YARNALL laboratories keep in close touch with the armed forces and government bureaus so that you can get immediate information and service on constantly changing specifications.
Many large manufacturers of war materials are now using Yarnall facilities and beating production schedules.
Yarnall laboratories are working 100% on war coatings. Let them work for you.
YARNALL
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Industrial Division
PHILADELPHIA . . . . PENNSYLVANIA

Colorthru Paint For Brick or Concrete

Colorthru is a new finish coat in color for masonry, manufactured by Colorthru, 20 W. 45th St., New York, N. Y. It needs no priming or undercoat. One coat brushed or sprayed on floors and walls penetrates, waterproofs, preserves and beautifies concrete, brick, stucco, cement, etc., whether inside or outside, painted or unpainted and can be applied to old or new masonry even when wet.

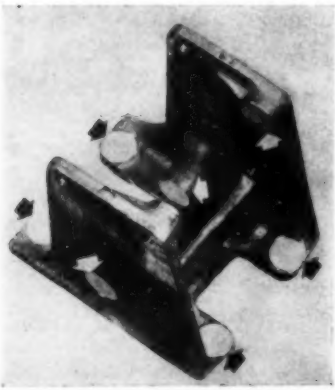
Dry Masking Stickers

Do you have many small regular or irregular shaped areas to mask when spray-painting? If so, you can obtain pre-cut masking stickers which are easy to put on and easy to pull off afterward.

Kum-Kleen stickers are quickly applied, without moistening, to metal, glass, plastic, wood or any smooth surface. They will not pop off, even under intense heat, yet they can be peeled off easily without tearing or scraping.

While standard sizes of Kum-Kleen labels will fit many ordinary masking jobs, special sizes and shapes are made to specifications. Much time is saved by having a mask cut to the exact requirements.

The Avery Adhesives, manufacturer of Kum-Kleen labels, is located at 451 E. 3rd St., Los Angeles, Calif.



Arrows show masking stickers.

New . . .

MATERIALS SUPPLIES EQUIPMENT

Quick-Dry Coating Is Very Durable

A fast-drying protective coating that stands up remarkably well under long and severe humidity, salt-spray and weatherometer tests is announced by Standard Varnish Works, Staten Island, N. Y. It is being used extensively on war products and is available in different colors, in a flat lusterless finish. It can be made up to meet infra-red reflectancy specifications. The material comes in the consistency of viscous paint and can be thinned with VMP naphtha for dipping or spraying.

This material, "905 Protective Coating," can be used as a primer directly on metal, wood, fiber, etc., and as a finish coating. It air-dries like lacquer in from three to five minutes, or its drying can be accelerated by baking. As a primer on metal, "905 Protective Coating," compares favorably with zinc chromate primer.

Prevents Adhesion of Welding Spatter

After months of field testing under a wide variety of service conditions, The Midland Paint & Varnish Co., 9115 Reno Ave., Cleveland, Ohio, announces "No-Spat," a liquid said to prevent

Charting your course

Post-war product planning will require imagination . . . and something more. Up-to-date knowledge of techniques developed during the war years . . . processes produced for war but applicable to your problems . . . facilities for mining among "military secrets" to become available to stake a claim for you. It's your imagination . . . give it free play. But let us add that necessary "something more" which can cut finishing time, reduce finish costs, and keep your product ahead of competition. Into the finish of your product should go the same inventive talent, engineering skill and productive genius which you have poured into the product itself. Insure NOW that they will. Your inquiry will incur no obligation. Address The Stanley Chemical Company, East Berlin, Connecticut.

Stanley Chemical

adhesion of welding spatter. According to the manufacturer, "No-Spat" should be brushed over the seam and area where weld spatter may fall. After welding the spatter may be wiped away, no chipping or grinding necessary.

One war production plant, found that by coating jigs (used to hold and align parts to be welded) with "No-Spat" that production greatly increased and spoilage almost disappeared. Welding spatter that fell on jigs unknown to operator threw production job out of alignment and required precious time to remove.

Gloss Synthetic Process Colors

Brilliant Gloss Synthetic Process Colors represent a remarkable development in durable coatings for use on bakelite and acetate sheets, as well as for use on sheet metal and other surfaces.

For non-metal name-plates, labels and signs, for example, these process colors are generally applied by silk-screen stencil directly on the colored plastic sheets.

The coatings dry quicky and produce a brilliant high-gloss durable finish that remains unaffected by the bending or flexing of the sheet of material to which they are applied. Remarkably clean-cut effects can be reproduced quickly and continuously in large production runs. For example, the manufacturer states that two of the largest manufacturers of radios use these materials to print plastic name-plates which have been adopted as a replacement for former metal name-plates. These gloss synthetic process lacquers are products of T. J. Ronan & Co., Inc., 749 E. 135th St., New York, N. Y.

Linseed-Oil Wrinkle Now Available

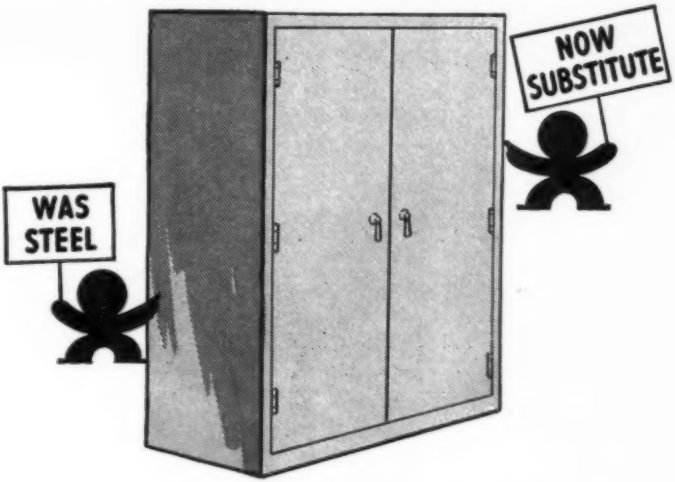
Rinkolin is the name of a new wrinkle finish which is made without the recently-forbidden tung oil, castor oil or oiticica oil. It is made with linseed oil and works satisfactorily in every respect . . . is used the same as the customary wrinkle finish; can be arranged to produce fine, medium or coarse pattern; is applied in usual way and bakes on similar time and temperature schedule.

Rinkolin is a product of Standard Varnish Works, 2600 Federal St., Chicago, Ill., and 2600 Richmond Terrace, Staten Island, N. Y.

Appointed Technical Director of United Lacquer Mfg. Corp.

The United Lacquer Mfg. Corp., Linden, N. J., announces the appointment of Mr. John A. Peterson as Technical Director. Mr. Peterson has been active in the development of organic finishing materials for many years and until his recent appointment was Assistant Technical Director. The same announcement states that all of the company's research and production facilities are now devoted to the development and production of United Specification Coatings for war products.

Sometimes one of the most obvious courses is the least apparent at the moment. On that large unit war job, which cannot be baked but must have a tough flexible finish to stand handling and assembly, why not swing back into one of the quick-drying, adhesive flexible lacquer jobs that have been in such wide and successful use on many small metal products? A clear primer, followed by a light surfacing with a flexible, not-too-easy sanding surfacer, and a coat or two of tough enamel and a job will be obtained (especially on steel sheets, for example) that will withstand a lot of abuse—and it will require only a few hours for application.—W. T.



HAVE YOU HAD TO CHANGE OVER FROM STEEL?

Government conservation demands every possible conversion from critical to non-critical materials. Have you had to substitute wood, masonite or plywood for steel in the manufacture of war orders? Are you having difficulties in getting a satisfactory finish on substitute materials? Would you like to know how other manufacturers have solved their "change-over" finishing problems?

The same Berry Brothers technical facilities and experience, which have helped many other manufacturers develop new finishes and finishing room methods, are available to you without obligation. Tell us what your production problems are and we will be glad to help you. Write for further information today.

Quality Finishes Since 1858

BERRY BROTHERS

Industrial Varnishes • Enamels • Lacquers

DETROIT, MICHIGAN • WALKERVILLE, ONTARIO

JERSEY CITY • BOSTON • CINCINNATI • CHICAGO • ST. LOUIS

Low-Fusing Ceramic

We are endeavoring to locate a ceramic material that has a low-fusing temperature, say on the order of 450° to 600° F. We have been informed that there is a low-fusing ceramic manufactured in Providence, R. I., but do not seem to be able to recall the name of the manufacturer. Perhaps you can assist us in locating the correct manufacturer.

It is our wish to obtain a low-fusing ceramic that will have adhering properties when heated to that temperature, so that two glasses will adhere to one another. The color is of no importance, as long as it has a ceramic base and will fuse at the temperature mentioned and at the same time be hard.—C. I. Co. (Technical and Scientific Glass).

We do not have a commercial porcelain enamel glass that will fuse (as we use the term) at 900° F. We do have glasses that fuse at 1,000° F. to 1,100° F. In an experimental way we have made a glass that softens at 900° F. but requires approximately 1,000° F. to fuse—as we use the term for porcelain enamel. In all of these references to temperature, time of heating and fluidity required will have a bearing. Durability of the glass under service conditions will also be a determining factor in reaching a decision as to the possibilities of furnishing a glass to approach the fusing qualities you desire.

If you will furnish us with information as to materials to be coated or contacted by this glass during fusing, the length of time the glass will be subjected to the firing temperature, and service conditions to be encountered after fusing, we can more definitely advise you as to the possibility of furnishing a glass for this application.—FERRO ENAMEL CORP.

We are sending you a sample of our L. F. Ceramic Cement, which material we hope will work satisfactorily. The temperature you have given, however, is very low for this type of work and we are not sure that our product will be satisfactory.—THE O. HOMMEL CO.

We may well have the material in which you are interested. However, we prefer to hold in abeyance any discussion of this until Dr. A. E. Chester returns. Dr. Chester will write you upon his return. . . .—PROMAT DIVISION; POOR & CO.

Questions; Answers

Questions are welcome and will be answered promptly by mail. Readers are invited to prepare and send in additional information relating to any of these questions and answers.

Trouble in Finishing Oak Furniture

We finish our furniture with a coat of stain, filler, sealer and two coats of lacquer. Our material is practically all oak. Some of this oak contains very fine hair-line checks which are not noticeable after the work is filled. A few days after all finishing operations have been completed, the finish raises over these checks and forms sharp rough ridges in the surface.

Ask Lowe Brothers...

For Up-to-the-Minute Answers

Yesterday's finishing problems are history in these days of changing wartime materials and methods. And Lowe Brothers Up-to-the-Minute "know-how" and resourcefulness is helping to solve the constantly changing finishing problems of many makers of vitally needed products for military use.

Recently, for instance, a manufacturer of Hospital Equipment assured us that the white synthetic enamel which we furnished to replace unavailable Porcelain has proved to be exceedingly satisfactory from the standpoint of both application and service.

So it is particularly wise, these days, to take advantage of Lowe Brothers broad experience with U. S. Government Specifications—as well as industrial finishes of every type. You too may have a problem on which we can render service, and we will welcome your inquiry.

INDUSTRIAL SALES
THE LOWE BROTHERS CO.
DAYTON, OHIO

Lowe Brothers
WARTIME FINISHES *for Industry*
IN ACCORDANCE WITH U.S. GOVERNMENT SPECIFICATIONS

Can you tell how this difficulty may be avoided? If not, what would be the most efficient method of removing these ridges?—N. Mfg. Co. (Mfrs. of Church Furniture).

Any one of several things can cause this. What you describe is especially likely to happen on plain oak, particularly plain red oak. A clue as to where to look for your trouble is the fact that somewhere in your material or process, you need more drying.

First, you might check your lumber in the white—just before it enters the finishing room. Is it really dry—thoroughly and uniformly dry to the point where reliable tests show that it has no more than 6% or 7% moisture content? Even if it was satisfactorily dry when it entered your millroom and cabinet room, standing over night and over holidays in a cold room, with weather conditions as they have been this winter, additional moisture may be taken on by the wood at its outer surface.

Assuming that the wood in the white is satisfactorily dry, then we suggest that you check up on the drying of your stain and filler. Do you happen to be using an oil stain? However, regardless of the type of stain you are using, the stained surface must be thoroughly dry before any additional work is performed.

Incidentally, if you are using stain and filler separately, have you ever thought of trying a combination stain-filler? Many concerns find that this works satisfactorily—and, of course, it saves the application time, labor and drying of one operation.

Your filler coat must be thoroughly dry before lacquer sealer is applied. Here may be the real cause of your trouble. Filler is sometimes deceiving. It appears to be dry but isn't—not down under the surface. After filler has been applied and the excess wiped off, try letting the work dry over night in a warm room. Then proceed with your lacquer sealer coat, followed by sanding and the final lacquer coats.

These suggestions come from men who are experienced in finishing and we hope they will help to remedy your trouble. If and when you do discover and remedy what is causing this trouble, we will appreciate your writing us about it in detail.—ED.

More About "Metalizing" Wood Caskets

I read with great interest Art Clark's article about Metalizing Wood Caskets (Feb., page 86), and believe that he has possibly worked out a good system, but there are a few things that I would like to clear up. (He was commenting on my article on the same subject, published in December 1942 issue, pages 100-102.)

I am always open for suggestions and for constructive criticism and am always learning things every day. I do not claim to know it all, but my experience has taught me that the "metalizing" of wood is not an easy task and, judging from some of the caskets I have noticed lately, some companies have not got the problem licked yet.

I worked as a finisher for 22 years on both wood and metal and for 18 years as foreman finisher on wood and metal, and feel that I have had some experience along these lines. The hard task on "metalizing" wood is to hold the grain down and keep it from showing through the finish. I have found, from long months of experimenting, that the synthetic sur-

For Faster Production of FINISH BAKING Choose DESPATCH

If you find it hard to keep pace with war production requirements because of inadequate finish-baking equipment, our 41 years experience in this field may help.

Today thousands of firms engaged in finish-baking on a large scale are using Despatch ovens. Most of these ovens are being operated 24 hours a day and have established all-time "highs" in finish-baking output.

All these users report *faster baking . . less labor* required . . . *less space* used . . . *less fuel* consumed. And their record-breaking output has been of excellent quality.

SELECT ONE OF THESE STANDARD DESPATCH OVENS . . .

SHELF TYPE RACK TYPE
MONORAIL TRUCK TYPE
INTERMITTENT CONVEYOR
CONTINUOUS (TUNNEL) CONVEYOR
ELEVATED CONTINUOUS CONVEYOR
MULTIPASS Automatic CONVEYOR
VERTICAL TYPE CONVEYOR

WIRE OR PHONE for full details; over 100 standard models from which to choose.

DESPATCH
OVEN COMPANY MINNEAPOLIS

facer I mentioned will do the job better than anything I can find. And, after standing for several months, the finish is just as good as in the beginning, but this is not always true of a finish started with lacquer.

I know of cases where, after standing for two weeks or more, finishes that looked fine at the beginning took on a rough appearance. The grain was showing through due to changes of temperature and moisture content in the air. These changes, in turn, caused expansion and contraction of the wood.

The synthetic surfacer that I use is made especially for this purpose and, after being thoroughly dried (not force-dried at too high a heat —not over 120° F.), it will not shrink or change in any way, but stays as smooth as metal. If this synthetic surfacer is subjected to too much heat it is liable to case-harden and cause trouble later on, but if it is allowed to dry over night there will be no trouble.

I have metalized oak with this system by first putting on natural wood filler and filling the pores, and then letting this filler dry before putting on the surfacer. I have a case here now that has been finished for seven months and it shows no evidence of any change taking place whatsoever. This is important, as some morticians may have certain caskets on hand for a long time, and it is necessary to have a finish that will remain good-looking indefinitely.

I am not writing this with the intention of getting into any argument, but merely to show that we too have a system that is working. —C. NAGAMOR.

If you spray heated lacquer, you need a fluid hose developed especially for this service.

Toluol, a valuable coal-tar solvent widely used in finishing materials, is the basic material for the making of the explosive T. N. T.

Graining Equipment; Methods

I wonder if you could furnish me with the name and address of some manufacturer who makes machines for painting veneer effects on metal or wood? I have seen such a machine somewhere, but can't recall where. It used a rubber roller to place the paint pattern on the metal.—B. R. C.

Prior to the present war, we produced all types of graining plates and the machines for using them. All of these plates involve copper which, of course, is not available now for such purposes. Even the finishing materials that we recommended are now in the process of going through their fourth or fifth substitution revision; so for the time being, any new developments in the process are just out.

When normal times return, we will be very glad to have you submit the details of your problem so that we can make specific recommendations and work with you on the job.—AULT & WIBORG CORP.

In addition to graining with rollers imprinted from an etched copper plate, there are other methods too; for instance, silk-screen stenciling, decalcomanias, imprinted lacquer films and the use of grained paper. Also, there is hand graining. Names and addresses of concerns to whom you can write for further information about the respective methods just mentioned are being sent by letter.—ED.

APPROVED IN PRODUCTION

Specialists?

Yes!

SPEED THE WAR EFFORT WITH APPROVED FINISHES

We have turned idle plants, caused by finishing troubles, into full production with approved and tested finishing materials, through research and practical experience. Let us produce a finish that meets Government Specifications PLUS, adapted to your present production methods. IT CAN BE DONE!

Developments We Are Proud of—ALL FIRSTS

No. 1080 Water Can Interior Coating developed for QM Spec. No. 111-C — APPROVED IN PRODUCTION.

No. 60 Clear and Pigmented Water and Gasoline Can Coating developed for Marine, Navy, Army and Lend-Lease — APPROVED IN PRODUCTION.

No. 425 Black Enamel for Personal Hardware applied in production and approved by QM Laboratories — APPROVED IN PRODUCTION.

No. H-75 Sealing Seam Compounds for troublesome double seaming operations — APPROVED IN PRODUCTION.

No. 5-622-AXS-684 One Coat Dipping or Spraying on bomb fins and ammunition, etc. — APPROVED IN PRODUCTION.

AXS 736 Clear Shell Coating, dip or spray — AND MANY MORE TOO NUMEROUS TO MENTION.

GOVERNMENT SPECIFICATIONS IN PRODUCTION — Zinc Chromate Primers; Holabird, Maritime, Naval Ordnance, QM Corps, Marine Specifications.

We've Helped a Score of Concerns with Their War Production Finishing Problems. We Can Help You, Too! Write us.

THE SCHAEFER VARNISH COMPANY

Incorporated

LOUISVILLE — — KENTUCKY

I have been carrying this article around in my pocket trying to find time to add to it, but time is getting short and I am so busy I think I had better send it on to you. If I can get a few minutes to myself I will write a little more. . . .—THE AUTHOR.

War Camouflage Ideas

BY W. BEACHAM

MANY people are wracking their brains trying to figure out some methods of shortening the war, or helping our boys toward the final victory. In various defense plants I have noticed better cooperation between Government inspectors and the operators. Small complaints are acted upon immediately to keep the ball rolling, and slight differences are ironed out while production is in full speed.

Camouflaged Steel Helmets

In numerous factories we are discovering better methods of increasing production. As an example, the olive drab paint—or as it is called in Canada, khaki green—when used on helmets, reflected light. Paint manufacturers were asked to try to overcome this characteristic. Within a few weeks olive drab paint was being used with a mixture of ground plastics, giving it a pebbled effect and cutting the sheen to almost nil. I was called in to help make this material work with automatic spray guns. While talking about the new type of paint, it was mentioned by the paint salesman that the Government wanted a camouflage system.

Upon returning to the plant I decided to try an idea that was running through my mind. I prepared a round tank and filled it with water. An agitator or stirrer in the bottom of the tank turned slowly, keeping the water moving in a circle. Then I fastened five automatic spray guns on the outside of the tank, each one spraying a different colored enamel, which floated on top of the water. Upon dipping a helmet into the tank a perfect camouflage was the result, with clear-cut edges. Just the old Easter-egg dip brought up to date.

Giant Aircraft Spray Booth

This method can now be handled automatically with an overhead conveyor. The article to be camouflaged trips the spray guns just before it reaches the dip tank. All guns open and close together, depositing a given amount of enamel on the water. The moving water is slowly whirled, with the floating paint, toward the center of the tank, and the conveyor dips the article down into the tank. The next article to be painted repeats this same procedure. *(To page 80)*

No. 1 in a series of Laboratory Data Sheets on Specification Finishes. Save and file these pages . . . or send for standard-size report forms punched to fit your binder.

TESTOR CHEMICAL CO. TESTORS ROCKFORD, ILL., U.S.A.

CONTROL LABORATORY DATA SHEET

PRODUCT: SEALER; WOOD, LIQUID

BATCH NO.: 273

SPECIFICATION NO.: 14113-Army Air Force

APPEARANCE: Clear, Transparent, Homogeneous

TOXICITY: Nontoxic

VISCOSITY: At 25°C .50 to 1.00 poise

FLASH POINT: Over 30°C (86°F)

SKINNING: Nonskinning

WORKING PROPERTIES: Excellent

PENETRATING PROPERTIES: Excellent

DRYING TIME: Less than 1 hour to touch and 6 hours to handle.

LIFTING PROPERTIES: Does not lift with Lacquer or Enamel

VEHICLE PROPERTIES: Excellent

ADHESION: Excellent

FLEXIBILITY: Excellent

WATER PERMEABILITY: .0976 grams

REMARKS: This sealer is a superior product. Its dry time will greatly reduce the time required to finish a plane or aircraft part. Its low water permeability insures a long life to the plane and a minimum of weight increase in damp or wet weather.

Write today for complete details on other Specification Finishes . . . and remember that our laboratory is at your service in the development of new and improved formulations to meet specific finishing problems. Send for folder describing our modern production facilities.

TESTOR CHEMICAL CO., ROCKFORD, ILLINOIS, U.S.A.

One of the largest camouflage units in the world was installed at a large midwestern factory. It is really a sight worth seeing. An airplane hanger has been completely turned into a gigantic spray booth. The whole length of the hanger consists of water-wash spray booths, extending from floor to ceiling. Booths have been built one above the other. When in operation it looks like one massive waterfall. Along the opposite wall, freshly washed air is blown in at the rate of 1,000,000-cu. ft. per minute—a wonderful installation for the purpose of camouflaging our largest bombers. I think the mechanics who installed it are due for a pat on the back. A job of this character shows that our everyday American mechanics are made of the right stuff.

I would like to ask our readers this: If you have any ideas regarding camouflaging, why not put them into print? There is the possibility that the powers that be will read about them and put them into practice, or even improve on them. Remember, if one of your ideas can only shorten this destructive war by two minutes, it's well worth the try; or if we can get the necessities of war to our armed forces faster by cutting down man hours here, it all helps.

One of our engineers ran into a problem a few months ago with zinc chromate primer holding up production. It was taking from four to six hours of working time to clean out the spray booth eliminators. This man had an idea that did not sound practical, but he started to work on it. After a thorough test we decided to ship the new booth to the plant that was having so much trouble. I am pleased to report that the booth has been in operation now for three months, 24 hours a day, without the eliminators being removed or cleaned. That is helping to speed production!

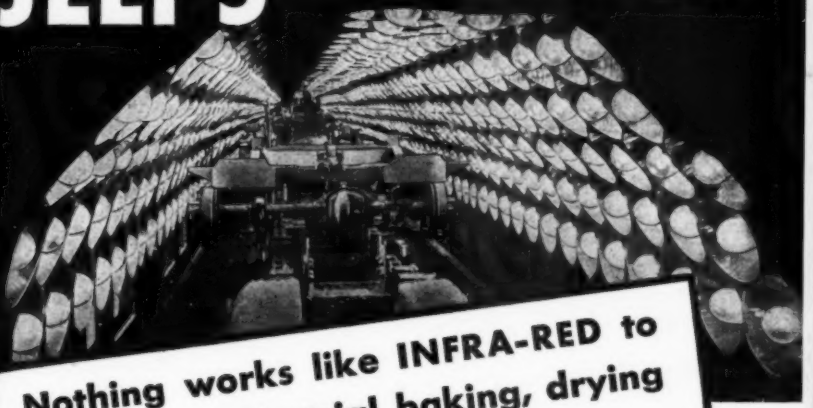
Semi-Transparent Camouflaged Raincoats for Army

Another camouflage idea that has been running through my mind for some time would put the cheese manufacturers to work. After cheese has been made, the watery substance or whey remaining is mostly waste. However, some of the whey is now used to make a cellophane type of material for wrapping the cheese. I would suggest turning this whey into a thicker material. If it is not waterproof, a little work would make it so. I mention this point because I am not sure of it being water-repellant, but I believe it is. The material could be dyed as it is being made and, when going through the rolling process, the colors would run together, giving a semi-transparent material to be made up into army raincoats, bandoleers, etc.

Our soldiers, if they had raincoats of this material, would not need to carry strips of cloth and rolls of colored canvas, which is extra weight, to camouflage themselves and their equipment. Their camouflaging material would be part of their clothing. For instance, suppose a machine gun is placed between rocks. The new raincoats are spread over the top of the rocks and machine gun nest. An airplane overhead could not see through the raincoats owing to their nearness to the ground and because they blend into the surrounding country. Gunners under the raincoats would be not only safe from observation but they could see through their protective cover-

JEEPS

INFRA-RED FINISHED in Minutes instead of Hours!



Nothing works like INFRA-RED to speed up industrial baking, drying and dehydrating

At Willys-Overland and scores of other plants where production miracles are performed daily, finishing that would take hours by old air-drying and baking methods is speeded into *minutes* with Infra-Red.

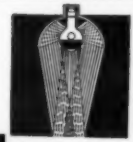
Instead of drying slowly inward from the surface, infra-red rays penetrate deep into lacquers, paints and enamels to start instant baking *from the inside out,* thus preventing surface film and saving up to 95% time in many applications.

Birdseye Infra-Red is so much better, faster, cheaper, easier to use that Bulldog Electric, Curtiss-Wright, Allis-Chalmers, White Motors, Allison (G. M.), Dow Chemical and other national war plants have adopted its use. Costs less to install, less to operate, and less to maintain. For complete data write today for booklet N3.

"BULLSEYE"*
for 100% Control

Inside-lined with a pure silver ring, the "Bullseye" prevents "spilled rays" and saves 25% heat loss averaged with ordinary clear lamps.

★ BIRDSEYE ★



WABASH APPLIANCE CORPORATION
345 CARROLL STREET, BROOKLYN, N. Y.
Mfrs. of Wabash Photolamps and Superlite Light Conditioning Bulbs

*This is only one of thirteen Birdseye heat lamp types and sizes, including Clear, Ruby and built-in Reflector types.

ing (being so close to it); still their movements could not be seen. They could train their gun on an enemy airplane and wait for an opportunity to fire.

I think any objections or difficulties could be easily overcome. For instance, the question may be asked, "How would you overcome the natural sheen of this new material?" Well, offhand, I would say sandblast it or spray it with a thin coat of very flexible non-sheen varnish or something similar.

Clear-Cut Edges Versus Fogged Edges

So many people have different ideas on color schemes and shapes of patterns. From observation and from experience in the last war I found that clear-cut edges of different shapes blend into the surrounding territory much better than fogged edges. I mentioned this point to a Canadian Government inspector while I was helping with a camouflage job in Ontario. He told me the Government wanted fogged edges in the camouflage, so we gave him what he wanted. But my argument still stands, and I will ask you this: Did you ever see leaves or a tree trunk without clear cut edges? Do the shadows of stones and boulders fade into the ground or do they have clear-cut shapes with distinct outline?

"Grounding" Metal Containers

STATIC electricity is one of the hazards that must be closely watched in departments where explosive materials are handled. The presence of sparks of even feeble nature may be disastrous. Naturally, the best way to provide a safeguard against static electricity building up in a tank, drum or other container that holds explosive liquid, or which is exposed to an explosive atmosphere, is to provide a metallic "ground" for it.

It is necessary that the grounding attachment, whatever it may be like, shall make absolute contact with clean metal in the tank or drum to which it is attached. One grounding device that has come to my attention is in the form of a C-clamp with a cup-pointed screw, similar to a set-screw. This screw bites through paint, rust or dirt, and gives positive contact with the underlying metal. The clamp has a bronze body to provide ready electrical conduction. It has a maximum opening of 1¼-in.—C. C.

Workers around paints, solvents, cleaners, removers, etc., need not be bothered by overspray or fumes; a variety of masks and respirators are available for partial or complete face protection.

Spray-Painting School; War Product Finishing

Wartime finishing methods will be the keynote of the first half of 1943 schedule of the DeVilbiss Training School for industrial spray operators, as announced by The DeVilbiss Company, Toledo, Ohio.

Sessions start on March 22, April 19, May 17, and June 21, and continue for one week periods. Classes are open to all users of DeVilbiss spray-painting equipment. There's no tuition fee—no obligation on the part of the individual or the firm represented.

The training course will include class and shop instruction in the use and care of equipment and other phases of wartime finishing practices.

The growing demand for faster application of those essential, protective war coatings and the problems of labor turnover and manpower shortage make the DeVilbiss School a timely help in filling an urgent need of industry. Further information and reservations can be secured by mail.

•SHELLAC•
ENAMELS
UNDERCOATS
LACQUERS
SEALERS
STAINS
GLAZES
•
NOVELTY FINISHES
IN STEP WITH THE TIMES
Industrial Finishes
that make the most of available raw materials to give you greatest durability, together with attractive appearance and economy.
• FOR APPLICATION BY ALL METHODS
JAMES B. DAY & CO., CHICAGO

Silicate of Soda Seals Castings

ACCORDING to a story about the dirigible, "Shenandoah" when this great sky ship was receiving its first trials, it was discovered that the light metal castings of the gasoline system were so porous that the volatile liquid leaked through badly. Rather than replace the entire equipment with heavier materials, it was decided to try impregnating the porous metal with something that could be pumped through the lines to seep into the pores, and which would not be redissolved by the gasoline. Silicate of soda was suggested, and with a little experimenting the necessary techniques were worked out. The system was made completely tight.

Since that time E Brand silicate has frequently been used for sealing porous metals. Lately the process has received new stimulus. Many metal parts formerly made by drop-forging are now being turned out at a faster rate by the casting process. While most of these are perfect, the number that are porous are great enough to be a serious production problem. It is costly and time consuming to remelt and recast them, so any scheme that avoids this is helpful. The fundamental simplicity of the silicate method makes it the logical solution to the problem.

There are many procedures used by plant operators. The simplest involves only soaking in a bath of dilute silicate. The porous metal absorbs the silicate like a dunked doughnut and when it is drained and dried the casting is ready for service. Sometimes, however, the porosity is so fine that silicate will not be absorbed by merely immersing in the liquid. In that case the dilute solution is pumped into the casting under air pressure which is maintained as long as the liquid sweats through. In extreme cases the castings are first put under vacuum in order to get maximum penetration.

When the porous area has been filled, the silicated castings must be drained and dried. If they are to be used where they will be subjected only to gases or non-aqueous solvents, ordinary air-drying may be sufficient. If they are to be in contact with water solutions they should be baked. Steam, however, may rehydrate oven-dried silicate, and for such service it is best to give the silicated casting a calcium chloride dip.

Some operators use an acid to precipitate insoluble silica, but in either case the second impregnation should be followed by an oven treatment. For all ordinary service the castings so sealed will hold tightly for a lifetime of service. Great numbers of aluminum, magnesium, bronze, steel and alloy castings as big as a steam boiler, as small as a tiny valve, have been successfully treated in this way.—Silicate P's & Q's.

Becomes Sales Manager of Ferbert-Schorndorfer

Mr. Ray Gourley has been appointed sales manager of the Ferbert-Schorndorfer Co., Cleveland, Ohio, it is announced by David Andrew, president.

Mr. Gourley has a wide experience in the paint and varnish industry. Except for a short interruption, when he served in the Field Artillery in France and was wounded in the battle of Metz, he has been actively associated with the industry for over 18 years. He originally joined the Ferbert-Schorndorfer Co. as a specialty salesman, drawing on his knowledge and success in selling insulating varnish, wire enamel and ignition cable lacquer. He advanced in the company to the position of field manager and then to his present post.

I. C. D. FORMULA NINE
NON-INFLAMMABLE « *wax free* REMOVER »

for paint, varnish, lacquer, baked enamel, adhesives

EASY TO APPLY—NO AFTER-CLEANING

ORDER TRIAL GALLON AT DRUM PRICE

I. C. D. FORMULA 9 is the standard of safety and quality . . can be sprayed or brushed . . doesn't raise grain nor discolor . . quickly removes all kinds of finishes and coatings . . costs less to use . . saves time, labor and material.

SPECIALTY COATINGS—I. C. D. Labs. have specialized in the formulation and manufacture of non-inflammable coatings and substitute finishes. If you have a tough coating or finishing problem send in your specifications, finishing schedule and requirements. Immediate action and a prompt reply promised.

INDUSTRIAL CHEMICAL DEVELOPMENT CORP.
111 MADISON AVE. NEW YORK, N. Y.

Nylon Paint Brush Bristles

PAINT brush bristles of the new tapered nylon are critically needed in war production and by the armed forces and will not be available commercially until after the war, according to D. D. Payne of the Plastics Department, E. I. du Pont de Nemours & Co.

A semi-works unit is running 24 hours a day, 7 days a week, to produce tapered nylon to replace the natural bristle formerly imported from the Far East. Although two full-scale units are ready for installation, the government will take every pound of tapered nylon until the war is over to paint ships, tanks, guns and other ordnance.

These nylon bristles are the first man-made ones with the taper, strength, resiliency and inertness to paint ingredients of the natural product. They wear at least three times longer than natural bristles.

Du Pont manufactures nylon in lengths of 4, 4½, and 5-in. to replace the long, lithe pig bristles necessary for paint brushes, but which are the most expensive and the most difficult to obtain. Tapered nylon in lengths somewhat shorter than 4-in. may be available after the war, but will not compete with natural bristle in the very short lengths.

When tapered nylon is commercially available, brush manufacturers will find that it has many advantages over the natural material. The fact they are made in America will eliminate necessity for large inventories and speculation in an uncertain and precarious foreign market.

New Books

CATALOGS
CIRCULARS
NEWS RELEASES

Facts About Metal Polishing

A new booklet with the above title contains 40 pages (5x7-in.) of illustrated practical information which is of value to all who have anything to do with metal polishing. For a free copy, write Norton Co. (Norton Abrasives), Worcester, Mass.

Wax-Fortified Paints

A twelve-page illustrated booklet (8½x11-in.) about Johnson's Wax-Fortified Paints, why they are wax-fortified, what makes them economical, and where they are used, has been published by S. C. Johnson & Son, Inc., Racine, Wisc. Industrial uses for these paints are illustrated and described.

Book on "Evercrete"

(Concrete Preserver)

A 16-page booklet of information about the remarkable liquid coating "Evercrete," for treating concrete surfaces to dust-proof, waterproof and oil-proof them, has been compiled by Evercrete, 19 W. 44th St., New York, N. Y.

Sand Blast Bulletin

A bulletin that describes and illustrates small sand-blast units, dust collectors and vacuum pumps, comes from Leiman Bros., Inc., Christie St., Newark, N. J.

Tinting Color Chart

A tinting color chart that lists various colors and the tinting colors needed to match practically any specified new or aged color has been prepared for free distribution by E. I. duPont deNemours & Co., Finishes Div., Wilmington, Del. The folder has 12 pages 8½x11-in. and the contents are all arranged in convenient form for quick reference.

Electrical Equipment Book

"Wartime Conservation," a new 96-page booklet just published, contains recommendations by Westinghouse engineers for selecting, applying and using electrical equipment so as to achieve the best possible output with the greatest saving in critical materials.

The book covers up-rating of motors, thermal temperature loading of transformers, industrial network systems, line equipment and materials; and gives tips on saving and salvaging materials as practiced in the various Westinghouse plants.

In addition to pointing out ways of saving vital materials in new equipment purchased, the booklet gives many examples of how existing equipment can be made to give better service and greater output by up-rating or rebuilding with more efficient materials than originally used.

All recommendations in this new book are in line with policies suggested by the WPB for the conservation of critical materials. A copy of booklet B-3206 may be secured from Dept. 7-N-20, Westinghouse Electric & Mfg. Co., East Pittsburgh, Penna.

Safety Equipment Catalog

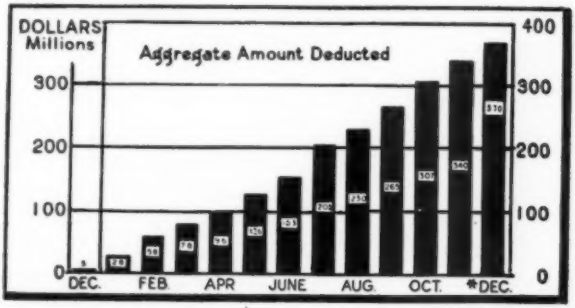
Catalog No. 50, containing 144 pages —134 pages describing safety equipment and 10-page index—has just been released by The Boyer-Campbell Co., Detroit, Mich. Included in the pages of the Boyer-Campbell catalog are hundreds of products that take in every phase of the safety problem.

Training Employees as Job Instructors

To provide the executive with a guide for outlining a specific plan and program for training job instructors in his own company, the Metropolitan Life Insurance Co. has issued the report "Training Employees as Job Instructors."

This handbook of training principles and practices, based on a survey conducted by the Metropolitan's Policyholders Service Bureau, discusses such important questions as the selection of job instructors, the time and place for their training, the consequences of inadequate training, the cost of training and many others that concern executives. Included in the report are samples of training programs now in

Tomorrow's SALES CURVES ARE BEING PLOTTED Today!



*Approximate

THIS CHART SHOWS ESTIMATED PARTICIPATION IN PAYROLL SAVINGS PLANS FOR WAR SAVINGS BONDS

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There is more to this chart than meets the eye. Not seen, but clearly projected into the future, is the sales curve of tomorrow. Think what $4½ BILLION per year in War Bonds, saved through the Payroll Savings Plan, will buy in the way of *brand new consumer goods tomorrow.*

Here indeed is a solid foundation for the peacetime business that will follow Victory. But there is still more to be done. As our armed forces continue to press the attack in all quarters of the globe, as war costs mount, so must the record of our savings keep pace.

Clearly, on charts like this, tomorrow's Victory—*and tomorrow's sales curves*—are being plotted today.

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This space is a contribution to America's all-out war effort by

INDUSTRIAL FINISHING Magazine

operation in war production industries and many exhibits illustrating the material used in such programs.

An executive interested in the subject may obtain a copy direct from Policyholders Service Bureau, Metropolitan Life Insurance Co., One Madison Ave., New York, N. Y.

Facts About Zinc-Coated Sheet Metal

A useful, attractive booklet containing fresh information on Armco Zincgrip, and helpful suggestions on specifying, ordering, fabricating and finishing this special zinc-coated sheet metal, has just been published by The American Rolling Mill Co., Middletown, Ohio.

The file-size 26-page booklet is designed to assist purchasing agents, engineers, plant executives, foremen and workers in using Armco Zincgrip, which is defined as "a greatly improved sheet metal with a unique zinc coating that does not peel or flake when the metal is severely formed." Photomicrographs comparing the Zincgrip coating and a conventional galvanized coating visualize why this sheet metal takes severe forming without damage to the protective zinc.

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Carbon Filament Lamps, service proven, available in Inside-Silvered (self-reflecting) or in Clear Glass types. Write for details.
North American Elec. Lamp Co.
1030 Tyler Street St. Louis, Missouri

Portable Electric Sander Bulletin

A 4-page bulletin, printed in red, black and blue, illustrates and describes the new Sterling 1000 vibrationless portable electric sander, which is so useful for smoothing and cleaning wood and metal surfaces to be painted or refinished. This new machine has several unusual features. Copies of the bulletin are free. Write to Sterling Tool Products Co., 365 E. Ohio St., Chicago, Ill.

Blind-Riveting Aircraft

A new handbook, designed to aid the men in the field who are concerned with riveting operations on aircraft, has just been issued by the Cherry Rivet Co., Dept. 35, Los Angeles, Calif. It tells how to save time on the difficult riveting jobs, giving complete information on the Cherry Riveting Process, together with detailed instructions on the operation and care of Cherry Rivet tools. . . . includes 16 pages of charts, diagrams, dimensional sketches and photographs to present a clear picture of how these rivets are used for new airframe construction, field repair and airframe salvage.

Fluorescent Lighting Maintenance

How to properly care for your fluorescent installation, and get maximum lighting service from it is the subject of a new booklet just published by the Lighting Division of Sylvania Electric Products, Inc., titled "Timely Wartime Tips on Fluorescent Maintenance."

The booklet tells how to determine the frequency of a regular cleaning schedule, and how to figure the number of lamp replacements per month. It gives the steps to follow in a regular checking system before discussing equipment and many other valuable suggestions to keep fluorescent installations operating at peak efficiency.

A copy of this pocket-size, ready reference booklet may be secured by writing Sylvania Electric Products, Inc., Lighting Division, Salem, Mass.

Electric Lamps for Light and Heat

A new Government manual and price schedule on Birdseye lamps and lighting has just been issued by the Birdseye Electric Corp., Brooklyn, N. Y., for distribution to Government pro-

curement agencies, purchasing personnel, and Government lighting engineers. Designed to present the essential facts of productive wartime lighting, the handbook analyzes the five main types of lighting requirements and the efficiency and economy with which the five Birdseye types of reflector lamps meet modern problems of more productive lighting without separate fixtures or added line load.

In addition to complete information on those Birdseye lamps standardized for Government use on the 1943 contract, the schedule describes two lamp products to fill specific wartime problems—the Superlite light conditioning bulb for use without fixtures, globes shades, etc., where such equipment can not be secured, and the Birdseye infrared heat lamps for speeding up wartime production in industrial baking, drying and dehydrating.

Metal Cleaning and Surface Conditioning

A new 4-page folder contains information and illustrations about "a new science of metal surface conditioning and a new type of field engineering that are clearing war production bottlenecks." Features include the following:

1) Preventing rust and corrosion.
2) Removing smut, abrasive and lead.
3) Increasing salt spray test on paint.
4) Protecting parts against finger marks.
5) Cleaning all alloy parts safely.
6) Eliminating oil slushing.
7) Reducing washing to one stage.
8) Streamlining washers and layouts.

This folder is published by Solventol Chemical Products, Inc., 15841 Second Blvd., Detroit, Mich.

Adhesives and Coatings Folder

A small folder, printed in black and red, lists and briefly describes several durable adhesives and protective coatings which have been tested and have met contract specifications for use on war products. These materials are products of Union Bay State Co., 50 Harvard St., Cambridge, Mass.

If quality means anything in your paint job, stir and strain the material before using it.

Now—Eye Protection, too!
SR-151 Eyeshield Respirator

The efficient R-151 Chemical Respirator protects lungs against fumes—the cellulose-acetate Eyeshield protects face and eyes against particles or splashes. Full vision eyeshield fits snugly, comfortably; non-fogging, non-inflammable; easily removed. Order as SR-151. Get details.

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Dept. IF, 176 Johnson St., Brooklyn, New York

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SANDING BELTS—DISKS—Like New—Doubles Life of Abrasives — Removes All Gum, Resin, Pitch Instantly!

NEW MAGIC DISCOVERY!
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Special Free Trial Offer!

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1142 N. Meridian St., Indianapolis, Ind.
Telephone.....Riley 6771

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President and Editor.....W. H. Rohr
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Subscription Rates Per Year
U. S. and Possessions.....$2.00
Canada and Foreign Countries.....$3.00
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Editorial

Looking Ahead for After the War

Regardless of whether, at the moment, you feel optimistic, pessimistic or indifferent about the end of the war, it's going to affect you—if you are still alive. Conditions that are causing activities in some businesses to expand while in others they are shrinking or stopping entirely—these conditions will be more or less abruptly reversed; that is, in many cases.

While the details of all trends after the war cannot be forecast accurately, it is obvious that manufacturing establishments and individuals now concentrating all or part of their efforts in war production—after the war they will be directing their intelligence and energy toward helping supply the demands of a new peace-time and reconstruction era. The individuals and organizations who can shrewdly estimate what those demands are going to be, and who can effectively make themselves essential in the post-war picture—they are going to be ahead in the game.

Here's what a firm of management consultants says on this subject:

"All over the country, manufacturing concerns will be faced with a tremendous problem of returning to normal conditions, not only from the manufacturing standpoint, but more particularly from the change which will have occurred in products and in consumer demand, by reason of the war itself. Enormous manufacturing structures, operating at low cost, have been created through the war period, and the longer the war goes on, the greater the problem of post-war transition will be."

This firm of management consultants (and probably there are many others too) claims to be able to see clearly the difficulties under which manufacturers must operate, in so far as post-war planning is concerned. They have established research and laboratory departments through which to investigate the manufacturing capacity of industries, with emphasis on fitting present or new products to the equipment and capacity of a com-

pany looking forward to post-war markets.

Right from the war zone we quote the following letter—a letter from a well known substantial manufacturing firm in England, written January 8, 1943:

"In peace-time we manufacture large quantities of ladies' vanity boxes and cigarette cases from non-ferrous material, which cases are decorated by means of cellulose spraying and lacquering.

"We have developed our own methods for this work, but since we have become subscribers to your paper, we have been very interested in some of the methods of application of paint illustrated and described as being in use in the United States. While it is, of course, impossible for us to manufacture any of these articles under present conditions, we are naturally thinking of our post-war activities, and we shall be very glad if you could put us in touch with any manufacturers of spray paint and equipment in your country who have had experience in this work, with a view to their putting forward suggestions of an up-to-date plant suitable for this particular type of work.

"We have in mind the possibility of applying a conveyor system to the drying of the paint or lacquer after application, and if among your readers you have anyone who would be willing to make us any suggestions, we would appreciate it very much . . ."

Here is a firm looking forward toward activities after the war, notwithstanding the fact that it is so close to the battle fronts of this world-shaking conflict. Now is the time for all of us to be giving some thought toward planning for the future. Governments and large organizations are directing considerable research and planning in anticipation of the post-war period, when some will be "shaken down" while others are elevated to positions of greater power and responsibility.

Why So Many Employes Are Absent From Work

★ Absenteeism is greatly hampering our all-out war production. It is one of the most serious problems facing the average foreman today. In many war factories the number of absentees averages as high as 10% each day. Naturally, this seriously hinders production. It causes thousands of man-hour losses per day.

Aside from slowing up production in all departments of the average war plant, the absence of workers increases labor costs because the foreman finds it necessary to train and keep several extra employes on the payroll in his department. He must have extra employes to substitute for those who do not report for work—and every foreman knows what it means to try to train new workers in these days of serious labor shortages.

Frequent and repeated absenteeism also causes the foreman to be constantly switching his men from one operation to another in order to try to maintain his production. In doing this he cannot hope to achieve the same results in quality of workmanship and volume of out-

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★ Guest Editorial . . . Many readers can write an excellent editorial — two or three paragraphs that present a timely suggestion or valuable idea which will stimulate real thought on a live subject. The Editor welcomes guest editorials and pays for those that are published.

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Provides Complete Waterproofness
Furniture » Floors » Bowling Alleys

Order Five Gallons at Barrel Price

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Factory—Rahway, N. J.

put, because if a worker is to be both efficient and a large producer of work he must stay on his regular operation continuously day after day.

There are several reasons for the great increase in absentees from work during the last several months. Shortage of manpower and laborers has brought on an indifferent attitude on the part of many of the employes toward their work. They realize that if they quit their present job they can easily get another job as soon as they want it; so they just stay away from work whenever the notion strikes them, even for the most trivial reasons.

The average American worker is now getting higher wages than he ever made before, hence he has more money in his pocket. When a fellow has money in his pocket he often adopts an independent attitude and just stays away from his job because he knows that he can live if he has a little money laid aside, even if he doesn't work regularly.

Because of the induction of so many men into the armed forces, it has made it necessary to hire a great number of new workers, many of them women. Most of the new workers have never had any industrial experience before. They have never had to work regularly, so they don't realize how important it is to be on the job every day. This is especially the case in the South.

Failure of the department foreman to impress upon his employes the importance of their job and how vital their work is to the war effort, often causes employes to feel that it doesn't make much dif-

ference whether they are present every day or not. They assume that in a big factory they just wouldn't be missed if they are not on the job. They may believe that their job is only a minor one anyway.

Poor health probably causes more absences from work than all other causes combined. No workman will be on the job every day if his health is poor. This condition of poor health can be brought on by several things, some of which I list below:

1) Working too long hours. This eventually causes poor workmanship and production.

2) Poor light, which causes eye strain, headaches and mental fatigue.

3) Poor ventilation; improper temperature and humidity in working quarters.

4) Short lunch period, which causes hasty consumption of food.

5) Many defense centers have had their population doubled and sometimes tripled. This causes crowded housing, hence poor living conditions.

6) Lack of recreational facilities in many defense centers has been brought about by inadequate transportation facilities, shortage of gasoline and tires, etc.

Many workers today are finding it extremely difficult to get transportation to and from their work. Oftentimes several workers have to depend on a single car to carry them. If this car breaks down they have to stay away from work until it is repaired.

These are just a few of the many reasons for absenteeism today. Some of these causes cannot be eliminated. They are brought about by the war and they are beyond our control. However, many causes of absenteeism can be corrected by an

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Are meeting today's demands under the stress of war conditions.

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SAVINGS up to 25%
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PRESSURE SPRAY GUN

Patented Nozzle Reduces 25% Mist and Saves Paint

Better atomization, greater speed, G. M. Gun lays material more uniformly on object. Excess mist eliminated; paint saved. Patented nozzle with combination of external and internal atomization gives double breakage; finer atomization. From ⅛-in. to full wet 14-in. fan spray. Very moderate price. For details write Dept. L.

G. M. MANUFACTURING CO.
Engineers, Mfrs. of Complete Spray Equipment
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SAFEGUARD YOUR SPRAY BOOTHS

Apply Wyandotte Spray Booth Coating *first* for quicker removal later of layers of inflammable paint. It takes only a thin coating to make cleaning easier, speedier, more economical. Write Wyandotte Chemicals Corporation, J. B. Ford Division, Wyandotte, Michigan, for full details!

Wyandotte F-100 will help cut your floor-cleaning costs. Even heavy soil disappears when this remarkable compound gets to work!

CROWN

"25"

This NEW Crown gun gives high efficiency and speed in production work and maintenance and other painting and finishing jobs . . Uses time-tested Crown "20" Spray Head assemblies . . Full Spray Width, Material Adjustment . . Write for literature and prices.

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Warehouses in Principal Cities

alert tactful foreman, through the co-operation of his employer. We foremen must strive to eliminate absenteeism so as to speed up our great war program and hence assure an earlier Allied Victory.—H. W. CHESTER.

Morale There and Here

★ "Morale," says General Montgomery, "is the thing." Superior morale will be a great factor in routing the enemy from his strongholds and speed the day of Victory.

Morale is an intangible something we all fight a battle to acquire. Yet there is no set procedure for its acquisition. We all have individual ideas of what morale is: The fighting Marine on Guadalcanal might call it grit or just plain "guts." Still another may term it faith in one's self and country. In short it's a feeling of spiritual, mental and physical well being, charged with determination to win.

There are numerous ways to define the word, but we can be sure of this: Good morale on the fighting front is a reflection of our morale at home. Let's do all we can by keeping our surroundings cheerful and pleasant and by buying bonds. This shows our faith in our country and it instills in our fellow workers a zealous determination to win.—N. H. VOIGT.

To You, Mr. Spray Man

The name or model number on your spray gun may not be to your liking—it may not be the most suitable for the work at hand—but please don't make this an excuse for altogether unsatisfactory workmanship. Clean up that gun, get

Stranger Than Arabian Nights

THERE'S NO TIME TO LOSE—THERE'S JUST TIME TO WIN!

INSTRUMENT BOXES
AIRPLANES
GUN STOCKS
BOMB SIGHT BOXES
TOOL CHESTS
MARINE PARTITIONS
RADIO INDUSTRY, ETC.
SKIS

LT. GENERAL MARK W. CLARK, U. S. A. set the stage for the invasion of North Africa. The story of his approach by submarine to a secret rendezvous and his meeting at a villa with French officers and officials is indeed stranger than fiction. The bags of gold they carried and the loss of $18,000 when their raft upset adds glamour to the venture. It required imagination plus audaciousness to conceive and execute this daring plan.

The men on the production front have been equally imaginative and audacious though less dramatic in their achievements.

Phone, wire or write and let one of our finishing experts help you "keep production rolling."

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it properly adjusted and put your skill and knowledge to good account as you use it. Strive to equal or out-perform the operator who works with what is supposed to be a better make of gun or a more desirable model.

The war has developed a scarcity of numerous articles. In fact, many things are no longer obtainable. Honest efforts and sincere co-operation are needed to prolong the useful life of such important equipment as spray guns and everything that has to do with spraying. In industries not engaged in vitally essential war work, the priority system often prevents frequent replacement of certain equipment that is in demand. Something like this may be responsible for your having to work with a spray gun that doesn't suit you 100%.

Remember, American fighting men often face unfavorable odds in one form or another, but their commander's orders must be obeyed. They know what we, back home, expect of them. They pitch in and do their best with what is available, and under conditions as they find them. Their intelligence, resourcefulness and daring in using what they have enables them to make a creditable showing, often against superior numbers of seasoned fighters with plenty of excellent equipment. Eventually, if we make good our promises, they will have superiority in numbers, as well as in quality and quantity of needed equipment . . . and eventually you may get the spray gun of your choice. In the meantime, carry on, and do it cheerfully.

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109 IMLAY STREET BROOKLYN, N. Y.
Established 1917

Production on the Move

★ Today, from American factories, thousands of cannon, tanks, guns, airplanes and other pieces of fighting equipment flow, in an unending stream, to the four corners of the world. Throughout America the surface-cleaning and protective-coating departments of all plants, large and small, are doing their part. With infinite care, yet with an amazing speed, the surfaces of every tank, every plane, and every other piece of equipment are carefully smoothed, cleaned and painted. Perhaps some of the equipment goes into the tropics, or maybe it is forwarded to the frozen north. Wherever its destination, upon its arrival it becomes something needed to use against our enemies. They said it couldn't be done, that time would not permit the proper construction and finishing of those tools needed to defend a free people against militaristic dictators.

But the job is being done—and the more of our efforts, time and money we put into it now and continuously from now on, the sooner we will all see and appreciate a complete allied Victory.—H. J. ETHERIDGE.

Automatic spray outfits can be remarkably efficient and economical—if you have an intelligent man to set up, adjust and maintain them.

Make it a point to keep all of your spray equipment clean. It looks better, works better and gives you a better reputation.

Letters from I. F. Readers

(Continued from page 8)

the expansion and contraction of hot and cold water and give us a usable fixture.

It is our impression that there may be a lacquer or a chemical "plate" that will do this work in a satisfactory manner. We will appreciate any suggestions on the use of these, or other material for this work.—W. D. T.

Testing Laboratories

We have several samples of finished plywood which we would like to have tested and compared to the present finish used on plywood aircraft surfaces. In writing you we thought you could advise to whom we should send the samples or where we could obtain small pieces of aircraft plywood to finish with our system and then submit them for testing.—R. & E. Co.

In a letter we are submitting names and addresses of several independent testing laboratories, any one of which can probably render the service you require.—Ed.

Use Only the Approved Fire-Fighting Devices

I should like to call your attention to the fact that a lot of unapproved fire-fighting equipment has appeared on the market since the outbreak of the war. Many readers interpret announcements of such products in their trade or industrial papers as implied endorsements. Yet many of these devices have little fire protection value; all of them are inferior, in one way or another, to approved equipment; and most of them are dangerous in that they impart a false sense of security. In the interest of industrial fire safety, therefore, the use of such equipment should not be encouraged.

Without exception, the merits of any fire-fighting device can be judged by whether or not it has been approved by Underwriters' Laboratories, Inc., or Factory Mutual Laboratories. If so, it bears a label indicating such approval. Any manufacturer of fire-protection equipment may apply to these bodies for approval. If he fails to apply, or if approval is denied, the efficacy of his product should be questioned. On the other hand, manufacturers who have obtained approval for their products invariably make a point of this fact in their advertising and publicity.

With the increasing demand for industrial fire protection due to a va-

Provides easy-to-wear comfort and safety against vapors of paints, lacquers and enamels encountered in spraying; such as turpentine, petroleum distillates, acetates, coal tar derivatives, alcohols, etc. Cartridges quickly replaceable. Bulletin EM-3.

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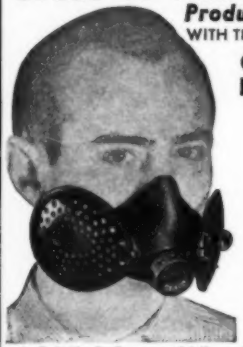
OUR MEN NEED
★ BOOKS ★

SEND
ALL YOU CAN SPARE

That book you've enjoyed — pass it along to a man in uniform. Leave it at the nearest collection center or public library for the 1943 VICTORY BOOK CAMPAIGN.

SPEED UP WARTIME Production!
WITH THIS NEW



Cesco No. 94 RESPIRATOR

★ Full U. S. Bureau of Mines Approved (No. BM-2142) against Type A (Silica), Lead and Nuisance Dusts. Equip your workers with this new COMFORTABLE and SAFE Respirator for FASTER DEFENSE PRODUCTION. It's the "Cesco No. 94." Write.

Chicago Eye Shield Co.
2367 Warren Blvd. Chicago, Ill.

MIRACLE
5 Gallon BLUE BOY Model
PAINT REJUVENATOR

Restores Paints, Lacquers, Enamel Products, Primers, to original consistency in 3 to 10 minutes without opening the can. Available for Round or Square 5-gallon cans. Explosion-proof electrical equipment if desired. Also other units from ¼-pint to 50-gallon drum capacity available. Originators of Paint Rejuvenating equipment—ten years—thousands of satisfied users.

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500 ROBERT ST., ST. PAUL, MINN.

riety of war conditions, plus the fact that restrictions have been placed on the manufacture of certain kinds of fire-fighting equipment, it is not surprising that attempts should be made to fill the gap between supply and demand with inferior merchandise. But there is still enough approved equipment available to take care of legitimate needs for increased protection; and the two approval bodies mentioned here have further eased the situation by granting temporary certificates of approval, valid for the duration, for certain kinds of equipment which are now being made with non-critical substitute materials. In most cases, this temporary approval simply means that such equipment will pass standard performance tests but cannot be expected to stand up for as long as the devices made of more durable materials.

Up-to-date lists of approved equipment can be obtained directly from the two laboratories mentioned: (Underwriters' Laboratories, Inc., 207 East Ohio Street, Chicago, Ill.; Factory Mutual Laboratories, 184 High Street, Boston, Mass.). May I suggest that whenever editorial mention of a new fire-fighting device is under consideration, you would find these lists useful in determining its status, particularly in those cases where the wording of a release does not make this clear?

I hope that this information will be helpful. If you have any questions, we shall be glad to try to answer them. — L. W. Hutchins, Director, Safety Research Institute, Inc., 420 Lexington Ave., New York, N. Y.

Masking Material

In further reference to your article on new masking material, mentioned on page 119 of your January 1943 issue, kindly forward us the name and address of this concern.—A. Mfrs.

It is described and identified on pages 90 and 92 of Jan. 1943 issue.—ED.

Spraying Inside Shells

PLEASE AIR MAIL NOVEMBER 1942 COPY OF INDUSTRIAL FINISHING . . . FURTHER INFORMATION REGARDING SPRAYING INSIDE SHELLS WILL BE APPRECIATED.—J. M. S.

We would like to know from whom we can secure data on internal spray guns, as described in the article, "Spraying Inside Shells, Tubes and Containers," by George Montgomery, published in your November 1942 issue. What we would like to know is the

minimum opening that would accommodate one of these guns; and the maximum depth we can reach through this opening.—U. M. Corp.

Spray equipment manufacturers who advertise in this magazine can supply just what you want. We are notifying them about your inquiry.—Ed.

Industrial Safety Hats for Women

Four smart models of fashion-engineered hats for women in industry have been created for Mine Safety Appliances Co. by Lilly Daché, America's foremost hat designer.

These cool, lightweight, attractive hats serve a double purpose, according to the manufacturer, in that they provide complete hair coverage and better head safety for women, as well as giving a lift to morale through finer appearance. They are easy-fitting and comfortable; cool—with free air circulation; moistureproof—water won't harm them; and washable—easily cleaned with soap and water. Each style fits all heads, eliminating the need to stock head-sizes.

For further details on the new Lilly Daché headwear for women in industry, write to this publication, or direct to Mine Safety Appliances Co., Braddock, Thomas and Meade Sts., Pittsburgh, Pa., requesting Bulletin CJ-1.

Standard Varnish Promotes W. E. Santoro

The Eastern Division of Standard Varnish Works, announces the promotion of Mr. W. E. Santoro to take charge of the Pigmented Coating Section of the Research and Development Laboratory.

Mr. Santoro is a graduate of Pratt Institute and has had many years of varied and extensive experience in the protective coating industry.

Before coming to Standard he was in charge of varnish research and development with a nationally known finish manufacturer. He has been with Standard for the last four years.

Stanley Chemical Co. Adds to Its Technical Staff

The Stanley Chemical Co., East Berlin, Conn., announces the addition to its technical staff of Dr. A. J. Cofrancesco, who will devote his efforts to the field of synthetic chemistry and the development of rubber-like materials.

Dr. Cofrancesco graduated from Wesleyan in 1933, receiving his B.A. with distinction in chemistry and his M.A. in 1934. During 1934 and 1935 he was with the Guggenheim Corp. of New York. The following two years were spent in the laboratory of The Stanley Chemical Co. In 1939 he received his doctor's degree from the Yale Graduate School of Chemistry and for the past three years has been with the Calco Chemical Co.

Engineers Promoted by Detroit Rex

W. W. Davidson, Vice President in charge of Sales of Detroit Rex Products Co., manufacturers of metal-cleaning equipment and cleaning compounds, announces the advancement of Ernest N. Taylor to Acting Manager of the Western Region. Mr. Taylor's headquarters are in the Chicago office, 1166 W. Cermak Rd.

George Pew has been promoted, from Resident Engineer in the Eastern Region office at New York City, to manager of the Quotation Department at the company's Detroit headquarters.

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